Student Medicine

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The Journal of the American College Health Association

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Student Medicine

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Official Journal of the
American College Health Association

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General Information

STUDENT MEDICINE, the official journal of the American College Health Association, was established to provide a medium for the exchange of information relating to the practice of medicine in college and university health services. It welcomes the opportunity to publish articles pertinent to this area of medical practice.

Manuscripts of papers read at the Annual Meeting of the Association are to be filed with the presiding chairman following their presentation and will be published if acceptable to the Editorial Committee. Other manuscripts submitted for publication should be sent to Dr. Ralph W. Alexander, Gannett Medical Clinic, Ithaca, New York. Business correspondence and books for review may also be sent to the same address.

Manuscripts will be considered for publication if they are original papers and are contributed solely to STUDENT MEDICINE. They should be typewritten with adequate margins on firm paper. All material should be double-spaced, and the original, not the carbon copy, should be submitted. Illustrations should be drawn in India ink on white paper. Tables should be typed on separate sheets. If the number of illustrations or tables is excessive, the author may be asked to help defray their cost.

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Abbreviations should follow the style used in the *Quarterly Cumulative Index Medicus.*

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Editorial Comment

DEFENSES AGAINST ISOLATION

PHYSICIANS and other professional people who work full time in student health services are often isolated to a considerable degree from other workers in their field of interest. This isolation may be geographic, for many colleges and universities are considerable distances from centers of professional activity, or it may be merely professional isolation resulting from little contact with other members of the profession.

The physician who becomes isolated and does not participate in a free interchange of information with other physicians suffers a deterioration of his professional skills and competence. In this era of research and rapid scientific development such deterioration takes place quickly unless ways are found to combat it.

We can dismiss geographical isolation with brief comment, as it plays only a secondary role in the production of professional isolation, the real culprit. The inconvenience of distance can be overcome if there is motivation to do so.

Professional isolation and ways of combatting it will be discussed from the standpoint of a physician, but much of what is said can be applied to members of other professions.

One of the most widely used means of keeping up with new developments is the reading of current literature, but the profusion of medical literature is so great that no one person can even scan it all to pick out what is useful to him. This journal has been attempting to be of service to student-health personnel by publishing "Abstracts of Current Literature." We desire to increase the value of this department for our readers, but we can do so only if our readers help us. They can do this by sending us abstracts of any articles which they read and find interesting or think

may be of interest to others. If more of our readers will serve as abstracters, we can bring to attention more articles of especial importance and thus help make the reading of current literature more selective and valuable.

There are several other activities which can protect against professional deterioration, and in the pages of this journal are examples of some such activities which are within the grasp of almost anyone. There are reports of clinical research projects, a study utilizing information from the medical histories of entering students, a letter to the editor reporting a procedure the writer has found useful, and a book review. Such activities not only benefit those who perform them but also will be useful to some who read about them.

Membership in professional societies can help in preventing isolation, but only if there is full participation in the activities of the society. Too often, physicians in institutional practice either do not belong to the local medical society or, if they do, are members more in name than in activity.

Postgraduate courses are worthwhile, but for many physicians, especially those in smaller schools, it is difficult to attend them, since the majority of such courses are given during the school year, when student-health workers are least able to take time away from their work. Some way should be found to permit the physician occasional attendance at a postgraduate course.

Last, for purpose of emphasis, and not because it is of least importance, is the Annual Meeting. This is at least comparable to a postgraduate course and can offer much more, for it is an opportunity for the informal exchange of information and ideas with many others who share similar interests and strive to find solutions to the same problems.

The student-health physician is especially vulnerable to professional isolation and the resultant deterioration of his professional abilities. He must develop as many defenses against this as he can. If he is not successful, the quality of medical care in our student health services will be lowered. There is no standing still, for to do so is to become ever farther behind as medical progress continues its rapid advance.

CENTENNIAL YEAR OF COLLEGE HEALTH SERVICES

ANNUAL MEETING

AMERICAN COLLEGE HEALTH ASSOCIATION

April 25, 26, 27, 28, and 29, 1961

Park Shelton Hotel, Detroit

PROGRAM OUTLINE

Tuesday, April 25

7:00–9:00 P.M. Early Registration

Wednesday, April 26

8:00–11:30 A.M. Optional Section Meetings

11:00 A.M. Meeting of the President and Vice-President with Presidents of Regional Affiliates

9:00–12:00 noon Registration

1:00 P.M. Opening General Session

Presiding: Dr. Irvin W. Sander, Medical Director, Wayne State University

1:00 P.M. Welcome: Dr. Irvin W. Sander, Director of the Host Health Service

Invocation: Rabbi Max Kapustin

Welcome: Dr. W. Harbison, Vice President of Academic Administration, Wayne State University

1:15 P.M. "Dr. Edward Hitchcock"

Dr. H. B. Bruyn, University of California

1:45 P.M. "Historical Development of College Health Services"
Dr. Ruth Boynton, University of Minnesota

2:15 P.M. President's Address: Dr. Samuel I. Fuenning

3:00 P.M. Discussion of Need for Recommended Practices and Standards for a College Health Service
Dr. Gordon G. Bergy, University of Washington and Dr. Frank O. Robertson, San Diego State College

Special Committee Report on Recommended Practices and Standards for a College Health Service
Chairman: Dr. Ruth Boynton, University of Minnesota

4:30 P.M. "The College Health Movement Throughout the World"
Dr. Ralph Canuteson, University of Kansas

5:00 P.M. Announcements

5:30–7:00 P.M. Tea and Reception

6:30–7:30 P.M. Meeting of the Special Committee on Recommended Practices and Standards with all Section Chairmen

7:30 P.M. Council Dinner Meeting

Thursday, April 27

7:30 A.M. Breakfast
President and President-Elect with Section Chairmen

9:00–11:00 A.M. Section Meetings

11:30 A.M. First Business Meeting
Election of Officers
Report from the Council

12:00–1:30 P.M. Association Luncheon
Presiding: Dr. Lawrence Holden, Affiliate Coordinator
The program for the luncheon will be devoted to the activities, accomplishments, and work of the Affiliates.

2:00 P.M. General Session
Presiding: Dr. Paul C. Trickett
Address: "Counseling"
Dr. Morris Fishbein

2:45 P.M. Panel on Mental Hygiene and Counseling
Dr. John Wilms, Psychiatrist, Purdue University, Dr. Elizabeth Slocomb, Ph.D., Psychologist, University of Michigan, and Vernon Keye, M.A., Psychiatric Social Worker, Wayne State University
General Discussion

3:45 P.M. "Present Day Issues in Health Education"
Dr. James P. McCormack, Wayne State University

4:15 P.M. Reactor Panel:
Dr. Henry B. Bruyn, University of California, Moderator, and Dr. Fred Hein, American Medical Association, Dr. E. B. Pfefferkorn, Oshkosh State Teachers College, Edward J. Dvorak, University of Minnesota, and Dr. W. H. Southworth, University of Wisconsin
General Discussion

5:15 P.M. Announcements

6:30–8:00 P.M. Social Hour

8:00 P.M. Association Banquet
Presiding: Dr. Samuel I. Fuenning, President, A.C.H.A.
Invocation: The Rev. Edward H. Peters, C.S.P.
Speaker: Dr. John Dorsey, Professor of Psychiatry, Wayne State University College of Medicine
Topic: "Self-Awareness and Health"

Friday, April 28

7:30 A.M. Breakfast
President and Vice-President with affiliate presidents

7:30 A.M. Breakfast
Nursing Section

9:00–11:30 A.M. Section Meetings

12:00–1:30 P.M. Association Luncheon
Presiding: Dr. Samuel I. Fuenning, President, A.C.H.A.
Invocation: Rev. William B. Hutchinson

Speaker: Dr. James Lewis, Vice President, Student Affairs, University of Michigan
Topic: "An Administrator Looks at the Student Health Service"
Introduction of liaison representatives

2:00 P.M. General Session
Presiding: Richard Bond, M.P.H., University of Minnesota
Address: "Present-Day Issues in Athletic Medicine," Dr. James S. Feurig, Michigan State University
Reactor Panel (to be determined).
General Discussion

3:00 P.M. Panel Discussion:
"What Is the Responsibility of Higher Education to Students Undergoing Rehabilitation?"

3:45 P.M. Panel Discussion:
"Present-Day Issues in Environmental Health and Safety and Occupational Health."
General Discussion

5:00 P.M. Announcements

5:30–7:45 P.M. Meeting of Special Committee on Recommended Practices and Standards with Section Chairmen

5:30–7:45 P.M. Council Dinner Meeting

8:00–10:00 P.M. General Session on Clinical Medicine
Presiding: Dr. Samuel I. Fuenning, President, A.C.H.A.
Address: Dr. E. Vincent Askey, President, A.M.A.
"Some Observations on Allergic Diseases in a University Student Population"
Dr. John M. Sheldon, Director, Department of Postgraduate Medicine, Professor of Internal Medicine, University School of Michigan Medical School
"The College Professor: His Health and Medical Care Habits"
Dr. Charles J. Tupper, Associate Professor of Internal Medicine, Assistant Dean of the Medical School, University of Michigan

PROGRAM OF ANNUAL MEETING

Saturday, April 29

7:30 A.M. Breakfast
Pacific Coast College Health Association

8:30–9:30 A.M. Section Meeting or Business Meeting
Discussion of "Recommended Practices and Standards" for college health services.

9:45 A.M. General Session
Presiding: Dr. Lawrence Holden, University of Colorado
Presentation of the Revised Recommended Practices and Standards for College Health Services by the Special Committee
General Discussion

11:15 A.M. "Into the Next Century in College Health Services"
Dr. Dana Farnsworth, Harvard University

11:45 A.M. Business Meeting
Resolutions
Report of Council
Introduction of new Officers
Announcements

12:00 noon Adjournment

SECTION PROGRAMS

ADMINISTRATION

Thursday, April 27

8:30 A.M. Panel Discussion:
"Hospital Accreditation"

9:30 A.M. Coffee Break

9:45 A.M. Discussion of Administrative Procedures and Standards for a Health Service
Dr. Boynton or Dr. Canuteson

10:45 A.M. Adjourn

Friday, April 28

9:00 A.M. Workshop on Administrative Problems

10:00 A.M. Coffee Break

10:15 A.M. Continuation of Workshop

11:15 A.M. Adjourn

STUDENT MEDICINE

Saturday, April 29

8:30 A.M. Business Session

ATHLETIC MEDICINE

Thursday, April 27

9:00 A.M. "Legal Liabilities of Team Physicians"
Dr. Feurig

10:00 A.M. "Prevention, Diagnosis and Treatment of Tooth and Jaw Injuries in Sports"
Fred A. Henny, D.D.S.

10:45 A.M. "Interim Report: Use of Soma Compound in Traumatic Conditions"
Dr. Holt

Friday, April 28

9:00 A.M. "Diagnosis, Treatment, and Prevention of Shoulder Injuries"
Dr. Hayes

10:00 A.M. "Surgical Treatment of Knee and Ankle Injuries" (A sound and color movie)
Dr. Crowley

11:00 A.M. Business Meeting

Saturday, April 29

8:30 A.M. Discussion of Recommended Standards

CLINICAL MEDICINE

Wednesday, April 26

10:00 A.M. Panel Discussion:
"Standards of Practice and Goals of Clinical Medicine"
Business Meeting
Adoption of rules of order
Reports of projects
Immunization, Dr. Bowie
Infectious mononucleosis, Dr. Dalrymple
Parasitism in Foreign Students, Dr. Ray
Uniform Reporting of Statistics, Dr. Herbolsheimer

Thursday, April 27

8:00–11:00 A.M. "Gastrointestinal Bleeding"
Dr. Nagobads
"Steroids and Mononucleosis"
Dr. Tynan
"Use and Abuses of Contact Lenses"
Dr. Hauser
Panel Discussion:
"Problem of Superficial Infections"
Moderator: Dr. Reiter

Friday, April 28

8:00–11:30 A.M. Symposium:
"Smoking and College Students"
Moderator: Dr. Thompson
"Montana College Freshmen and Rheumatic Heart Disease"
Dr. Rosenberg
Panel Discussion:
"Obesity and College Students"
"Viral Hepatitis"
Speaker to be announced

Saturday, April 29

8:30–9:30 A.M. "Mononucleosis" Breakfast

ENVIRONMENTAL HEALTH AND SAFETY

Thursday, April 27

8:00–11:00 A.M. "Operational Standards"
A review of the preliminary report and instructions to the committee
"Off-Campus Housing Standards"
Review of the final draft and instructions to the committee

Friday, April 28

8:00–11:00 A.M. "Operational Standards"
Final review and resolution of any impasses
"Housing Standards"
Final review and resolution of any impasses
"Control of Swimming Pool Waters"
Walter Cothran

HEALTH EDUCATION

Thursday, April 27

8:30 A.M. Discussion of Standards for College and University Programs in Health Education

10:15 A.M. "Studies about the Health Knowledge of College and University Students"
Dr. Kilander

Friday, April 28

8:00 A.M. Business Meeting

8:30 A.M. "My Favorite Health Education Course"
A series of three or four course descriptions by outstanding college health educators

10:15 A.M. Reactor Panel:
College health educators and college students

Saturday, April 29

8:30 A.M. Section Research Project
Dr. Rash

MENTAL HEALTH

Wednesday, April 26

Morning "Unique Problems of Ministerial Students"
Dr. Christensen
"Sexual Deviations in College Students"
Dr. Whitener

Thursday, April 27

Morning "The Effect of Deviant Group Membership upon Personality Development in College Students"
Dr. Whittington
Discussant: Warren Dunham, Ph.D.
"Some Observations of the Underlying Dynamics of Conflict in Foreign Students"
Lyle E. Ward, M.S.W.

Friday, April 28

Morning "Implications of the Book *Crime and Punishment* upon Freshman English Students"
Dr. Rabe

Business Meeting
Reports of Liaison Assignment:
A.P.G.A.
Orthopsychiatry
A.P.A.
Adolescent Psychiatry

NURSING SERVICE

Thursday, April 27

8:00 A.M. Business Meeting: appointment of committees

8:30 A.M. "Analysis of Nursing Activities in the Student Health Service at the University of Buffalo"
Susan Griffin

10:00 A.M. Report of Procedure Manual for College Nurses
Elizabeth McGeary

Friday, April 28

7:00 A.M. Breakfast

8:30 A.M. Discussion of Functions, Standards, and Qualifications
Raidie Merdinger

9:30 A.M. Discussion of Ratio of Nurses to College Students
Lucille Dadisman

10:00 A.M. Report of Workshop, "New Concepts for College Nurses"
Margaret Acosta

10:30 A.M. Business Meeting

Saturday, April 29

8:30–9:30 A.M. Discussion of Recommended Standards

Cardiac Murmurs in University Students: Incidence, Location, and Auscultatory Characteristics*

JOHN S. HANSON, M.D., AND RICHARD W. AMIDON, M.D., UNIVERSITY OF VERMONT

A CONSTANT and recurring problem for physicians has long been the recognition of the so-called "functional" cardiac murmurs. Also termed "innocent," "inorganic," or "physiologic," these murmurs are often inconstantly heard, misinterpreted, or overemphasized; significant murmurs denoting structural cardiac abnormalities certainly suffer the same fate.

The detection of cardiac murmurs, both innocent and organically significant, is of importance to college health services in evaluating students for athletics, ROTC programs, and extracurricular activities.[1] It is of equal importance from the psychological standpoint, with regard to allaying or preventing "cardiac neurosis" in this impressionable group and their parents. At the University of Vermont we are evaluating the incidence and

* The clinical assistance of Doctors A. M. Levy, R. W. MacCauley, G. S. Ray, and A. Caldwell is gratefully acknowledged. Valuable technical assistance was received from Miss A. Elizabeth Wilson and the nursing staff of the Wasson Infirmary, University of Vermont.

[1] E. Mannheimer, Phonocardiography in Children, in *Advances in Pediatrics*, VII (Chicago: Year Book Publishers, 1955), 171–207; S. Paulin and E. Mannheimer, The Physiological Heart Murmur in Children, *Acta Paed., 46:* 438, 1957.

characteristics of cardiac murmurs in a class of nearly 1000 students so that, although the anatomical and hemodynamic bases for the innocent murmurs may not be fully understood, we may at least, on the basis of experience and adequate follow-up study of patients with such murmurs, intelligently predict which are indeed "innocent."

The study has been set up in four distinct phases, the initial two of which are completed and the final two projected. The first step involved a screening of the students, as outlined below. Second, a carefully conducted reauscultation was performed at a later date to define the murmur characteristics more exactly. At this point each subject was told the nature of the study, and, whenever possible, it was strongly emphasized that the murmur was of no consequence to him as far as physical activity, longevity, and so on are concerned. Third, a full phonocardiogram, electrocardiogram, and chest x-ray will be taken of each student and the findings correlated with the murmurs. Finally, it is expected that each subject will be re-examined by auscultation at least once a year during his university stay and that final follow-up phonocardiogram, EKG, and x-rays will be obtained just prior to his graduation.

The present report covers only the results of the first two examinations. Later reports will be concerned with the more detailed studies and the experience culled from four years of contact follow-up.

Nine hundred thirty-five members of the entering freshman class at the University of Vermont (570 males, 365 females) were screened for the presence of an audible cardiac murmur at the time of their first school physical examination, in September 1959. For the men this occurred during the routine ROTC examination, and hence several cases with obvious cardiac disease were not included in this study. On the other hand, *all* female freshmen were examined by the physicians conducting this study, regardless of whether or not cardiac disease had previously been suspected or a murmur heard. The examining physicians were members of the University Health Service, including the authors, one of whom is in the practice of cardiology, and questionable or doubtful murmurs were always checked by the latter examiner.

The boys were examined in either sitting or standing position.

The girls were examined prone and in sitting positions, as well as in recumbent, lateral, oblique, and other positions if warranted. On the subsequent re-examination, conducted at the University Infirmary, both males and females were examined in prone, sitting, recumbent, lateral, and oblique positions.

During the re-examination the murmur was carefully studied with regard to its timing, point of onset in the cardiac cycle, duration, point of maximum intensity, and radiation. The murmur's character—its pitch and intensity, as well as whether it was blowing, rumbling, musical, and so on—was evaluated. The heart sounds were rated as normal, increased, or decreased in intensity, and it was determined whether any degree of splitting of either sound existed. Attention was also paid to additional cardiac sounds such as gallop and opening snaps.

Correlative signs suggesting cardiac pathology, such as displacement of the apical impulse, precordial bulge, pectus excavatum, thrill, and disorders of cardiac rhythm, were looked for in each case. During re-examination the effects of a short period of exercise (knee bends or jumping up and down) on all aspects of the murmur were noted.

RESULTS

As seen in Figure 1, there was a 13 per cent incidence of cardiac murmurs of all types in the male group and an almost 22 per cent incidence in the famales, giving an overall incidence of 16.5 per cent. These figures are in good agreement with those of Bock and Contratto, whose studies were conducted in student populations of comparable ages.[2] They also confirm a fairly prevalent feeling, gained from casual observation over the years, that murmurs of this character are significantly more frequent in the young adult female than in the young adult male. That four of the six definitely pathological murmurs were detected in the female group has no real significance because of the difference in subject selection as outlined previously.

[2] A. V. Bock, quoted in P. D. White, F. D. Adams, and D. Craib, A Note on Cardiac Murmurs: Recommendation for Revised Terminology, *Amer. J. Med. Sci., 203:* 52, 1942; A. W. Contratto, Significance of Systolic Cardiac Murmurs in College Students, *New England J. Med., 228:* 499, 1943.

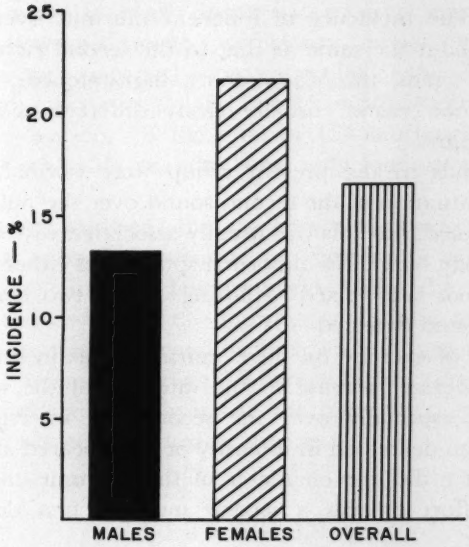

Figure 1. Incidence of audible cardiac murmurs in 935 university freshmen

It is of interest to note that over 50 per cent of these murmurs were not listed on the students' preadmission physical examination forms as having been detected by the examining physicians. This is not surprising but somewhat disconcerting, since a good majority of the murmurs were at least Grade II (on a VI scale), and some Grades III to IV. Undoubtedly, some measure of the greater degree of detection by the University examiners was attributable to their increased awareness.

In accordance with previous studies [3] the most frequently heard murmur was the Grades I to III blowing, high-pitched, short, early systolic type in the second and third left intercostal spaces near the sternum, often musical in character. This murmur accounted for 40 per cent of those heard in males, 68 per cent of those in females, and 55 per cent of those in the entire group

[3] A. A. Luisada, O. M. Haring, C. Aravanis, L. Cardi, E. Jona, and A. B. Zilli, Murmurs in Children: A Clinical and Graphic Study in 500 Children of School Age, *Ann. Int. Med., 48:* 597, 1958; C. P. Lynxweiler, and J. L. Donahue, Evaluation of Innocent Heart Murmurs, *South. Med. J., 48:* 164, 1955.

(Figure 2). The incidence of innocent murmur over the apical region was about the same as that in the second right intercostal space. Once again, this was a short, high-pitched, decrescendo, blowing systolic sound, usually easily differentiated from "organic" murmurs.

Heart sounds in the present group were normal. In several females accentuation of the second sound over the pulmonic valve region was noted, but this was usually associated with the presence of a slight body build. No abnormal splitting of either heart sound was heard, nor was "fixed" splitting of the two components of the second sound detected.

The effect of exercise on these murmurs was inconstant, but a slight to moderate increase in the intensity of the murmur was often heard, especially over the second left interspace. Apical murmurs often decreased in intensity or disappeared after exercise. In no instance did the character of the murmur change significantly on effort or was a second murmur first detected after exercise.

In six students the murmurs heard were unequivocally repre-

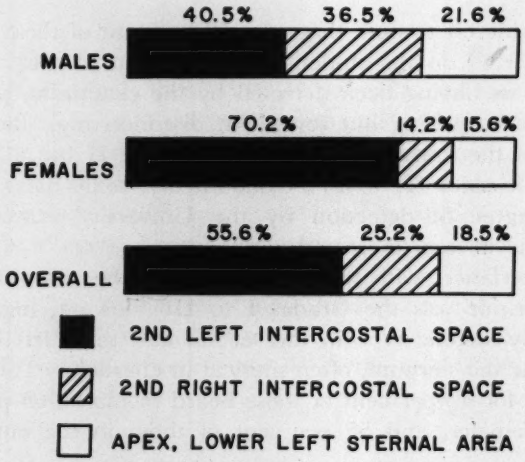

Figure 2. Anatomic point of maximal intensity of 154 "innocent" cardiac murmurs auscultated in 935 university freshmen

sentative of valvular heart disease. Conditions encountered included aortic stenosis, aortic insufficiency, mitral stenosis, mitral insufficiency, and suspected interventricular septal defect. These murmurs were quite typical, and in all but one instance had been previously recognized. Of the total of 154 murmurs auscultated at the initial screening examinations, only four were diastolic in timing.

Histories obtained from the students with innocent murmurs were without exception negative for significant cardiac-related symptomatology. In very few instances where the student had previously been aware of the murmur was there any apparent concern over its presence or significance, and no students exhibited a full-blown "murmur neurosis." There were no correlative physical findings associated with any of the innocent murmurs which suggested the presence of cardiac disease.

DISCUSSION

Numerous theories have been proposed to explain the oft-heard "innocent" murmurs of children, adolescents, and young adults. It has been recognized that conditions associated with anemia, tachycardia, increased blood flow (thyroid dysfunction) and vascular disease will produce murmurs easily mistaken as "innocent." Luisada *et al.* suggest the possibility that innocent murmurs may in fact represent residua of rheumatic or allergic valvulitis.[4] Far more frequently the presence of these murmurs has been ascribed to turbulent blood flow through normal valves, and the murmur characteristics have been likened to those of atrial septal defect murmurs. Paulin and Mannheimer have nicely demonstrated the relation of the murmur intensity to right ventricular blood flow.[5] This is consistent with Lewis' finding of a systolic flow murmur in normal people studied by intracardiac phonocardiography.[6]

Likewise, by employment of high-sensitivity pickups and a soundproof room, Groom has found murmurs in all of seventy-one

[4] *Op. cit.*

[5] *Op. cit.*

[6] D. H. Lewis, G. W. Deitz, J. D. Wallace, and J. R. Brown, Intracardiac Phonocardiography in Man, *Circulation, 16:* 764, 1957.

normal men, and forty-seven of these, or 66 per cent, were recorded at maximum intensity in the second and third left interspaces.[7] It is interesting to correlate these findings and the increased incidence in females of murmurs of maximal intensity in the second left interspace with the frequent radiological finding of a prominent main pulmonary artery segment in this same group.

The incidence of murmurs heard over the aortic valve region in the present group is higher than that previously reported. We feel that these murmurs probably represent transmission of the murmur so commonly heard in the second *left* interspace, but they may also be a phenomenon of flow through the aortic valve. Characteristics and timing of these aortic-area murmurs were identical to those of the pulmonic-area murmurs and offered no possibility of confusion with the typical "stenotic" (crescendo-decrescendo or diamond-shaped) murmur of aortic stenosis.

Although no conclusive evidence has appeared to connect the occurrence of "innocent" murmurs with structural cardiac abnormalities, we must still remember that *any* cardiac murmur may be of clinical significance even though the patient is asymptomatic at the particular time of the examination. Although rightfully unrestricted in their activity at present, these people warrant continued routine re-examination to determine whether an organic lesion is becoming manifest and physiologically significant. It is our hope that the present study will give some indication of the frequency with which this occurs, at least over the short four-year period of the investigation.

SUMMARY

Of 935 university freshman, 154 presented auscultatory evidence of a cardiac murmur, an incidence of 16.5 per cent. The incidence in the females was almost twice that in the males. Only five instances of unequivocal valvular or congenital heart disease were encountered. The majority of the innocent murmurs heard were short, high-pitched systolic sounds, most frequently in the second

[7] D. Groom, W. Chapman, W. W. Francis, A. Bass, and Y. T. Sihvonen, The Normal Systolic Murmur, *Ann. Int. Med.*, *52:* 134, 1960.

left intercostal space near the sternum. Further investigation of these murmurs is under way and will continue until the students leave school. Possible etiologic bases for these murmurs are discussed and the need for constant re-evaluation of the asymptomatic patient with a cardiac murmur is stressed.

A Descriptive Study of Schizophrenia in a College Setting*

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THE purpose of this paper is to report on a descriptive study of schizophrenia in a college and university setting. The study is admittedly exploratory rather than conclusive. It is a contribution to the investigation of two issues which recently were explicitly mentioned as suggestions for research by the *American College Health Association:* "pre-schizophrenic attributes and problems," and "the actual incidence of mental illness as to types and severity." [1]

The major focus of this study is schizophrenia, since this is the most frequently occurring psychosis during the period of adolescence. Several discussions are available which attempt to clarify the difficult question of borderline schizophrenia.[2] The purpose of this paper is not to enter this discussion on a theoretical basis,

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The author wishes to acknowledge the co-operation of his colleagues, particularly the support and constructive criticisms by C. Douglas Darling, M.D.

[1] *Health Services in American Colleges and Universities: Nationwide Survey Findings as Determined by Cooperative Efforts of the American College Health Association and the Continental Casualty Company* (Chicago: Continental Casualty Company, 1958).

[2] R. L. Arnstein, The Borderline Patient in the College Setting, in B. M. Wedge, ed., *Psychosocial Problems of College Men* (New Haven: Yale Univ. Press, 1958), pp. 173–199; P. Hoch, and P. Polatin, Pseudoneurotic Forms of Schizophrenia, *Psychiat. Quart., 23:* 248–276, 1949; R. P. Knight, Management and Psychotherapy of the Borderline Schizophrenic Patient, *Bull. Menninger Clin., 17:* 139–150, 1953; R. P. Knight, Borderline States, in R. P. Knight and C. R. Friedman, eds., *Psychoanalytic Psychiatry and Psychology: Clinical and Theoretical Papers* (New York: Internat. Univ. Press, 1954), pp. 97–109; L. Rangell, The Borderline Case, *J. Amer. Psychoanal. Ass., 3:* 285–295, 1955.

but rather to give a cross section of cases of schizophrenia in a college community. Before the actual description of schizophrenia is presented, it seems appropriate to comment briefly on some problems of terminology as well as to report on the incidence of psychosis in college.

Ambulatory schizophrenia as used in this study means schizophrenia in a patient who can be treated in college or elsewhere outside a hospital. The schizophrenic process is going on, but the student is able to continue to do acceptable academic work, concealing his psychopathology from the general public. But the picture is rarely clear-cut. Knight points out that it is quite possible for both psychotic and neurotic mechanisms to be present in the same individual.[3] The concept of ambulatory schizophrenia has been discussed more in detail by others.[4]

Nonambulatory schizophrenia in this study means schizophrenia in a patient who cannot remain in college during treatment, but must be sent home or to a hospital for psychotherapy.

True psychotic depression lacks certain typical schizophrenic symptoms, such as a split between ideas and affect, and is not characterized by bizarre behavior. In contrast to depression on a neurotic basis, a psychotic depression is less sudden in onset, more constant in its symptomatology, more crippling in relation to total performance, and less easily relieved by psychotherapy.

The incidence of diagnosed psychosis at Cornell University for 1958–59 was .3 per cent of the student population. The breakdown to differential diagnoses was: ambulatory schizophrenia 9; nonambulatory schizophrenia 16; true depression 4; paranoid condition 1; and psychosis with epilepsy 1. Thus, 9 out of 25 cases of schizophrenia were kept in college on an ambulatory basis.

THE STUDY OF SCHIZOPHRENIA

Now we shall turn to the descriptive study of schizophrenia in a college setting. A prominent mental health professional once

[3] Borderline States, *op. cit.*, p. 100.

[4] S. Fisher, Some Observations Suggested by the Rorscach Test Concerning the "Ambulatory Schizophrenic," *Psychiat. Quart., 29:* 81–89, 1955; M. H. Hollender, Ambulatory Schizophrenia, *J. Chronic Dis., 9:* 249–259, 1959; G. Zilboorg, Ambulatory Schizophrenias, *Psychiatry, 4:* 149–156, 1941; G. Zilboorg, Further Observations on Ambulatory Schizophrenias, *Amer. J. Orthopsychiat., 27:* 677–682, 1957.

said: "If you know schizophrenia, you know psychiatry." Although this is an exaggeration, it certainly contains some truth. Cases of borderline schizophrenia represent a difficult patient group even for the experienced mental health clinician.

The sample of patients for the present study was the twenty-five students who received the diagnosis of schizophrenia at our Mental Health Division during 1958–59. Of these nine were treated in the Mental Health Division on an ambulatory basis while continuing their college studies. Sixteen were separated from the university community.

The actual data were taken from the Mental Health Division's records for these patients. The bulk of this material was summary reports of interviews with the patients and members of their families, recorded by our psychiatric social workers, clinical psychologists, and the psychiatrist. The data also include correspondence with patients, families, deans of students, professors, and the university proctor, as well as a few diary excerpts.

The method of analysis was to read all the material and summarize each case separately. It seemed worthwhile to describe as accurately as possible how this patient subgroup appears to the clinician in a college setting.

The report on the results of the analysis will include mainly clinical descriptions, but also some working hypotheses relevant to the schizophrenic's experience and behavior. It should be made clear that only the writer is responsible for the theoretical suggestions, although he is using freely the actual observations made by his colleagues. The aim is to suggest a model of schizophrenia in college. Therefore, the focus is on the similarities of the cases rather than the divergencies. This implies that no single case will be entirely typical of the model; however, the model is meant to embrace most of the clinical data available.

Bizarre Ideas and Actions

One girl suddenly ran excitedly out of her dormitory without any apparent provocation. A boy felt he had made a "terrific discovery." He also felt that "people would read his mind." An-

other boy became seriously interested in "space travel." One boy felt very guilty because certain "evil magic wishes came true." He also believed in extrasensory perception (ESP) and felt he could "influence the thoughts and behavior of other people." One boy was once found lying drunk on his shotgun; on another occasion he was found sitting in a dark room with the shotgun in his mouth. He felt that he was not normal, but added: "Then again, who wants to be normal?" One very agitated boy ran out of our office while an appointment was being made for him. During interviews with the mental health staff he did numerous "push-ups" on the floor and stood on his head; he also snapped his fingers and pounded one fist in the other again and again.

One patient expounded a theory of psychoneurosis to a psychology professor and sounded "clearly delusional." One boy shaved off his eyebrows, shortened his eyelashes, and grew some rather unusual sideburns. He taught himself to speak with an especially low voice. Another patient was apprehended by the campus patrol wandering aimlessly around in a university building running his hands along the walls. Each day he was observed repeatedly cleaning his teeth in a public lavatory. When asked about his name, he said it was John Student, which was entirely fictitious. One boy "wanted his brain replaced." He also changed his last name because he was ashamed of being Jewish. In keeping with this he had plastic surgery done to remove a hump from his nose and make an addition to his chin. One boy suddenly took off on a trip 1,000 miles away and said he often had "wild ideas like that." He felt the "office lamp was part of him." His head was "stuffed with cotton," his hands felt "hollow," and "electricity was shooting through his body."

The writer has devoted so much space to these examples of "bizarre" ideas and actions because these matters are often frightening to other people. Whether a certain emotionally sick person comes to the attention of the mental health clinician is often a function of the degree of "strange behavior" that he displays. It often happens in these cases that someone else, perhaps a fraternity brother, a professor, a dormitory counselor, a parent, or a dean, shows explicit concern about such an individual.

Inappropriateness of Emotion, Thought, and Action

One patient had a "silly grin" on his face all the time he was talking about his serious problems. Sometimes it is as if the person stands "aside from himself" and finds all his miseries "very funny." One boy sat with closed eyes through most of his first interview with a clinical psychologist. He felt he had to because it gave temporary relief from the horrors of his inner world. Disturbances of thought processes, often indicated by rambling talk, flight of ideas, or compulsive repetitiveness, belong under this heading. Often the inner fantasy world becomes more important than "what is out there." Another display of "inappropriateness" is a compulsive need to be in control of a situation; this seems to be a fear of "being destroyed" by any kind of intervention from another person.

Weakness or Lack of Self Boundaries

It is the opinion of this investigator that most people maintain during their lives a certain cleavage between the private, inner self and the self that is displayed in relation to other people. Everyone has to learn to accept and live with his own uniqueness. A mentally healthy person shows a great sense of differentiation between what he chooses to communicate to somebody else and what he keeps for himself. In this sense it is perhaps normal to maintain a certain cleavage between one's autistic and one's interpersonal self. The schizophrenic individual, however, seems to lose this capacity to control his inner self. It becomes too pervasive and overpowering. His infantile attitudes "pop out" when he does not want them to, no matter how much he struggles to be in control.

This was very clearly illustrated in a young man during the excited phase of an acute catatonic episode of schizophrenia. For a few minutes he was in good contact with the clinician; suddenly he was removed from this interpersonal psychological field and was struggling with his inner fears and "bizarre" thoughts. Sometimes the onset of the schizophrenic condition is very sudden because the "walls" between different segments of the personality are penetrated, often in a close human relationship of great sig-

nificance. One difference between the borderline schizophrenic who remains in college and a schizophrenic who has to be sent away for treatment is that the former retains to some extent the capacity to control and live with his "bizarre," confused, inner self. For some this is only possible with a good therapeutic relationship. During therapy sessions it can seem to the clinician as though "strange thoughts and feelings are gushing up from the unconscious mind of the patient."

Extreme Dependency and Antagonism toward Parents

The clinical impression is that the schizophrenic patient is in one way or another extremely dependent upon his parents, often his mother. The expression "one way or another" is used deliberately because it may take the form of either overprotection or an extreme laissez faire attitude on the part of the parents. One girl felt rejected and pushed around by a domineering father. She did not feel she had an independent self; her parents had "crushed" it. Such a person becomes hypersensitive to any outside pressure whatsoever, and a paranoid attitude often evolves. It is as if she had learned in the past that she was unable to resist penetration through advice and orders. Consequently any suggestion seemed threatening. A similar picture became evident for a boy in this group. He was emotionally immature and overly dependent upon a domineering mother and a sick father.

With another boy the clinical impression was somewhat different. He had been forced to assume a too early independence in many ways. Therefore his natural need for dependence was frustrated during a crucial period of his development. In adolescence he became quite antagonistic toward his parents, particularly his mother. He discovered that he had struggled to please his parents with good grades rather than to work for his own future, and he resented them when he realized this fact. Such parents often object violently to a suggestion that their child should take a medical leave of absence to receive treatment. Instead they blame the university for their child's failure.

It seems increasingly clear that extreme dependency on parents and antagonism towards parents are intimately related. One boy felt that he was a failure in terms of his father's expectations that

he should be very masculine. When he had "cracked up," he refused to see his parents and covered his face with his hands. The more dependent a person is upon others for the satisfaction of significant needs, the more vulnerable he is. And when he thus becomes frustrated, he can turn "boiling mad." One young boy had once picked up his mother and "slammed her against the wall" so she had to be hospitalized with a concussion. Afterwards his stepfather had threatened to expel him from the house. As a matter of fact, most of his life he had lived with some other people on a farm, where he had enjoyed the only happiness he ever experienced.

Depression with Self-Destructive Tendencies

The schizophrenic patient seems to be suffering from lack of love and respect. Because he has never experienced himself as "lovable," he cannot feel any affection for himself. Instead he is often ridden by feelings of guilt and shame of himself and tends to feel extremely depressed by his lack of genuine accomplishments in life. Often he has suicidal tendencies; sometimes suicidal attempts are carried out.

One patient was underweight, and it is probable that she was unconsciously trying to starve herself to death. Another had grave eating difficulties and actually looked very fragile. One boy appeared so depressed in class that his professor called us about him, being very concerned. There is often a lot of weeping and crying in the picture. We have already mentioned the boy who was twice found with a shotgun. He complained that he felt both suicidal and homicidal. Another boy was barely rescued when he was found in the middle of the night sitting on the railing of a bridge staring into a deep gorge.

Some patients become "accident prone," like the boy who had had a series of automobile mishaps and jokingly said that he liked the idea of "playing with death." Another patient had frequent thoughts of suicide such as taking an overdose of sleeping pills or hanging himself or jumping overboard from a boat. One boy had been observed by a secretary to put his hand through the glass, and at another time he was seen tearing everything off a bulletin board in a rage.

Confusion about Self, Values, and Religion

A feeling of being lost and confused is very common in the schizophrenic patient. Minor examples of this are his getting confused about when to take an examination or what day it is. More gravely, a person may feel so overwhelmed by conflicting forces that there is free-floating anxiety of "going crazy." Often the patient starts seriously questioning moral values and religious beliefs. In an outburst of adolescent rebellion the patient may throw all his traditional beliefs overboard. This leaves him with little outside support. Before another set of values or a reformulated religious philosophy emerge, the patient can be both panicky and confused. Sometimes endless "philosophizing" takes place without arriving at any good answers. One boy was approaching religion to find a "crutch" in his bewilderment. Occasionally a patient hands in excerpts of a diary. One boy wrote: "Why is the world foreign, cold, like an empty void, except for the full pain of endless misery? . . . I feel I am more sensitive than other people. . . . Am I a genius, or am I some kind of God?"

An Unhappy Love Relationship

Adolescence is the time when the individual must come to grips with his surging sexual drives. The schizophrenic person experiences especially strong difficulties in this area, perhaps because he is seeking satisfaction of somewhat unrealistic needs in relation to the opposite sex. Such a patient is not at all prepared to develop a truly give-and-take relationship. Therefore his attempts at intimacy often bring about an unhappy love affair.

One girl who was engaged to be married suddenly ran out of her dormitory one day proclaiming dramatically to everybody her great love for a different boy. Another girl wondered rather passively whether the boy still loved her; if he only loved her, she would feel safe. A boy vaguely adored a girl from a distance. Another young man corresponded with a girl many hundred miles away, and when she finally "dropped" him, he felt panicky and lost to the extent that he had to be hospitalized. Often the schizophrenic prefers to have a pen-friend of the opposite sex elsewhere than to have a face-to-face relationship which is threaten-

ing. Such a patient is invariably uncomfortable when he is dating. Sometimes there is also fear of homosexuality. One boy who never had dated said that he was not like other people and admitted to unusual fantasies of a sexual nature toward girls, thoughts which he could hardly accept in his own mind, much the less communicate to others. In a diary he wrote that a certain girl represented "the unattainable," and he sent her anonymous love poems.

Paranoid Tendencies

Although some patients in this group can be given the differential diagnosis of paranoid schizophrenia because of the magnitude of such feelings, paranoid tendencies are characteristic to some extent for all schizophrenic patients. One characteristic of paranoid conditions is that the person fails to distinguish the realistic limits of interpersonal influence. He believes that the influence of the other person is greater than is really possible. Often such a patient has a past history in which his parents have not treated him as an independent, free human being, but as an object to be manipulated according to their idiosyncratic whims.

One girl became very suspicious and felt people were talking about her. She began to feel increasingly persecuted by her roommates. After she had been sent away for intensive treatment, she wrote a letter to our psychiatrist full of accusations about how she had been mishandled, with copies to the Dean of her College, the Dean of Women, and the President. One boy felt that "people could read his mind" and became very critical of his professors. Another boy with an excessive need to be in control at all times believed he had great power to "influence others and be influenced through ESP." The most extreme case in our sample was a boy who believed that through a "fantastic plot" he was "drugged" during initiation ceremonies by his fraternity brothers. He felt they conspired against him, and gradually his paranoid thoughts grew into real delusions of quite a bizarre character. For example, he believed that certain articles in the *Cornell Sun* were printed against him personally. Another patient felt that "the psychiatrist stole his ideas."

Extreme Mental and Bodily Tension

The most extreme kind of schizophrenic tension perhaps is seen during acute catatonic excitement. One boy with such tension, already mentioned, showed peculiar motor mannerisms during contacts, such as doing push-ups in the waiting room. This looked like an attempt to relieve tension which had become quite unbearable. Often extreme bodily tension can be easily observed. At other times the signs are more indirect, such as excessive smoking or drinking. A complaint of feeling "tensed up" is typical. Both a mental and bodily rigidity is sometimes apparent.

Social Withdrawal

Part of the syndrome of schizophrenia is certainly a withdrawal from intimate contact with other people. It is not necessary that the moving away from people be physical; a purely psychological withdrawal is perhaps more typical. This moving out of the interpersonal field is a defense against getting hurt by genuine encounters with other individuals. Such a withdrawal is often accompanied by feelings of loneliness and insecurity. Often schizophrenic patients complain that they do not get along well with people; they are unable to initiate and maintain friendships. If they try to befriend others, they become very disappointed and angry when their unrealistic expectations are not fulfilled. The social withdrawal often coincides with excessive daydreaming and fantasying. A schizophrenic has seldom felt a true sense of belonging to a group. One boy could explicitly name the "last person he communicated with." A typical statement is: "Nobody understands me." It is often very hard for the clinician to establish a good talking relationship with such a patient. Even the taking of a simple personality test is often met with hesitation.

Disregard for Social Regulations

In order for any community to function smoothly and effectively certain rules and regulations have to be observed and enforced. This is true in a college. Not infrequently our schizophrenic patients find it difficult to be obedient in the proper ways. Sometimes

they are brought to the attention of the Mental Health Division after having been apprehended by the campus patrol for one thing or another. Their reasons for breaking rules are partly thoughtlessness and partly rebellion, but they cannot control their impulsivity because of deeper unconscious psychodynamics.

This disregard for the proper mores takes several forms. One boy had stolen a key which gave him access to an otherwise locked faculty lounge in a university building. He also was caught taking doughnuts from a cafeteria without paying. This boy had a similar history of peculiar behavior and stealing at another school from which he had been discharged. The boy was referred to the Mental Health Division by the proctor of the University. Another boy left school without formal clearance. One patient objected to some of the routine procedures during his stay at the Infirmary. This same boy had been previously apprehended for compulsive shoplifting. Another boy received disciplinary attention because of his role in a "panty raid." The schizophrenic patient often finds it difficult to adjust to R.O.T.C. training. One boy wanted to join a pacifist group to avoid R.O.T.C.

Deterioration of Academic Work

The severely disturbed schizophrenic patient typically is so preoccupied with his bizarre ideas and inner confusion that this interferes with the quality of his academic work. Some try to hang on to school no matter how sick they are and have to be talked into leaving. Others realize that there is an impossible situation and want to leave to get well. They find it increasingly difficult to assume normal academic responsibilities, such as going to classes, writing papers, and meeting deadlines. Sometimes they avoid confronting their professor to talk about such matters and let things slide for months.

A more objective investigation of the schizophrenics' intellectual capacities and academic work yielded the following results. The group of nonambulatory schizophrenics scored on the average 596 on the Scholastic Aptitude Test (S.A.T.) compared with a weighted average of 609 for all Cornell students. On the other hand, the group of ambulatory schizophrenics scored 626 on this test.

Whereas the I.Q. for the nonambulatory schizophrenics was

128, the corresponding figure for the ambulatory patients was 136. Again, there seems to be evidence that the ambulatory schizophrenics have a higher intelligence level.

The official average grade for all undergraduates at Cornell during 1958–59 was 77.07. The nonambulatory patients scored an average of 75.28 during the semesters before they had to leave, so their academic performance seems to have been fairly close to the average for all students despite the fact that a severe emotional disturbance was developing. The ambulatory schizophrenics scored 77.88, also quite close to the average academic performance. We should keep in mind, however, that their performance is really quite remarkable, considering the fact that they are trying to cope with a psychotic process at the same time.

It has been suggested that schizophrenic patients in college strike the clinician as being exceptionally intelligent and gifted students. The results of our inquiries seem to yield the following information. The ambulatory patients seem to be considerably more intelligent and gifted than the patients who have to leave college. But the two groups taken together show an average rather than a superior performance academically. On the S.A.T. they do not score significantly above the average for all Cornell students.

Yet, some of these schizophrenic students are admittedly gifted. One student scored 800 on one of the subtests of the S.A.T. Another had two such perfect scores on the S.A.T. One had a reported I.Q. of 171. Still another was first in his high school class of more than four hundred students. Three scored in the middle eighties at Cornell. But the group of schizophrenic students as a whole is not outstanding in regard to intelligence and academic status.

Previous History of Psychopathology

Many of the schizophrenic patients in this group had a previous history of psychopathology, although some cases seemed to have a rather sudden onset. One boy had been hospitalized and treated for a so-called "adolescent problem." Another boy had been a mental patient at a Veterans' Administration hospital. Some of these patients had been seen off and on for a year or two before a definite diagnosis of schizophrenia emerged. One boy had re-

ceived regular psychotherapy on an outpatient basis prior to coming to Cornell.

Hospitalization Necessary

About two-thirds of the schizophrenic patients had to be hospitalized for some days preceding the time when they were sent away from Cornell with a medical leave of absence. Often sedation and tranquilizing drugs were prescribed to cope with their intense tension and confusion. Typically, the referral was made through the family doctor. In some cases special nurses were necessary at the Cornell Infirmary to protect the patient from his own destructive impulses. One patient was taken to a mental hospital with the help of the campus patrol because he himself feared he would try to escape.

The rest of the schizophrenic students have been able to stay in college while they received treatment on an ambulatory basis. These patients have shown varying degrees of improvement in regard to their control of thought processes, depression, and social withdrawal.

A CASE ILLUSTRATION OF AMBULATORY SCHIZOPHRENIA

Most mental health clinicians would know when a patient is too sick to stay in school. But it may be helpful to the reader to have a brief case illustration of ambulatory schizophrenia.[5]

This patient, A. B., came to the Mental Health Division in the fall of his junior year. He was hesitant and unconfident in his attitude and asked to see a staff member of the Clinic but refused to give his name. An appointment was made for him without his divulging his name, even though the receptionist explained the confidential nature of all communications in our division.

He had previously consulted two physicians in private practice in Ithaca so that he would not have to tell anybody at the Student Medical Clinic his name. When he also refused to tell the physicians in private practice his name, they strongly suggested that he

[5] All significant personal details have been disguised.

consult the Mental Health Division of the Clinic, with which they were well acquainted.

Finally he did tell his name and some of his troubles to the psychiatric social worker. He said he was afraid that he would have to leave school if any information about his previous mental illness got on his medical record. At one time he had in fact been hospitalized for treatment. He said that he was very compulsive and had certain rituals that he had to perform. He also remarked that he was very much of an introvert.

In spite of these problems he was going to all his classes and was doing his studying, but he was quite nervous and frightened about his condition. Furthermore, he was sleeping excessively, and this worried him.

Later he became willing to accept a referral to another staff member, a clinical psychologist, who was able to establish a relationship with him in spite of his being overly suspicious, negativistic, and secretive. He further explored the problems already mentioned and also said that he hated R.O.T.C. and felt critical of certain courses as being too theoretical and impractical. During this treatment he continued to do well in his work, attended all his courses, dressed properly, and did not bother other people. He eventually even passed his R.O.T.C. course.

In one of his interviews with the psychiatrist the patient appeared somewhat apathetic, overly suspicious, and overly dependent. He was obviously afraid and was so preoccupied with this fear that he found it difficult to co-operate with the therapist. He did, however, take some medication at our suggestion and became able to pattern his life so that he could continue his college work.

After rather intensive treatment during the first few months we continued to see him occasionally until he was through with college. He was appreciative of our help and developed a feeling of trust in us. He also learned to trust one of the counselors in his particular college. The patient graduated in good standing, with a cumulative average slightly above that of the university as a whole. After graduation he planned to apply for graduate work and continue his academic career.

This case illustration of ambulatory schizophrenia shows two major distinguishing characteristics as compared with the cases of

borderline schizophrenia that have to leave college; they manage to do their college work and keep their psychosis to themselves. Several characteristics of the college schizophrenia model were evident in the case of A. B., such as his suspiciousness, his bizarre ideas and mannerisms, his difficulties with authority figures, his dependency, and his social withdrawal.

CONCLUSION

The purpose of this paper is to report on a descriptive study of schizophrenia in a college and university setting. Three psychotic syndromes are distinguished, namely ambulatory and nonambulatory schizophrenia and true depression. The incidence of diagnosed psychosis at Cornell University during the academic year of 1958–59 was .3 per cent of the student population. The diagnosis of schizophrenia claimed twenty-five of these thirty-one cases; sixteen were nonambulatory and nine ambulatory.

A content analysis of the records of the Mental Health Division for these patients reveal the following similarities which together may serve as a tentative model of schizophrenia in college: (1) bizarre ideas and actions, (2) inappropriateness of emotion, thought, and action, (3) weakness or lack of self boundaries, (4) extreme dependency and antagonism toward parents, (5) depression with self-destructive tendencies, (6) confusion about self, values, and religion, (7) an unhappy love relationship, (8) paranoid tendencies, (9) extreme mental and bodily tension, (10) social withdrawal, (11) disregard for social regulations, (12) deterioration of academic work, (13) previous history of psychopathology, and (14) hospitalization necessary.

A case illustration of ambulatory schizophrenia is presented.

Both the nonambulatory and ambulatory schizophrenics show the tendencies mentioned, but the ambulatory patients are able to keep their psychosis to themselves and to talk about their problems only to their therapist. Another difference between the two groups is that the ambulatory patients are able to perform academic work satisfactorily, some times even very well, whereas the nonambulatory patients become too overwhelmed by the psychotic process to be active students.

The Dispensing of Medicines in College Health Services*

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WHEN first asked to speak on this topic, my immediate reaction was that there was little I could say, as the dispensing of medicines is not a function of nursing and therefore could be considered illegal when practiced by a nurse. However, on further thought I realized that, as nurses, we frequently find ourselves in situations where we are expected to carry out activities, such as the dispensing of medicines and perhaps even prescribing them, which are not within the usual scope of nursing.

Are we sufficiently aware of what is within the scope of the practice of nursing and also aware of how easy it is to overstep the mark?

On consulting various dictionaries, I found that:

1. "To dispense" means to make up; to prepare and give out; to bestow in portions; to deal out.

2. "Dispenser" refers to a person skilled in preparing medicines from prescriptions. To practice as a dispenser, the person must have passed examinations held under the auspices of the Pharmaceutical Society and be registered under the Pharmacy Act.

3. "To prescribe" means to give medical advice or prescription, and the latter is defined as directions or formula written by a physician.

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* Presented before the Section on Nursing Service, American College Health Association, Thirty-eighth Annual Meeting, Toronto, April 28, 1960.

Prescription follows diagnosis. Anyone who diagnoses and then prescribes is practicing medicine. The nurse who makes a decision as to what is wrong with a patient and what medicine the patient should have may be said to be practicing medicine without a license.

It is the responsibility of a profession to state what its functions are. Nurses in the United States are more fortunate than we are in Canada, since their national organization has stated the functions, standards, and qualifications for the various fields of nursing. A number of independent functions are listed, such as those concerned with the comfort and hygiene of the patient, with making and recording observations, and with supervision of auxiliary workers and assistants. But a dependent function appears in most areas, namely the execution of nursing procedures and treatments under the direction of a licensed physician. The American Nurses' Association, in stating nursing functions, has referred to the administration of medicines as a dependent function, and I quote: "To administer drugs and medicines in compliance with the physician's written orders and fulfill other therapeutic measures as prescribed by him and which the nurse understands will not have a deleterious effect on the patient." [1]

Many situations in which a doctor is not immediately available and with which a nurse in a health service may be faced can be anticipated. The following is taken from the stated functions of an industrial nurse: "[She] gives emergency care in accordance with written medical direction . . . within the limits imposed by state nursing practice act." [2]

Drugs are powerful to help or harm; used intelligently they are of great therapeutic value but used unwisely they may cause irreparable damage. For example, an individual may have idiosyncrasies and develop untoward reactions; drugs given indiscriminately may mask symptoms and thus delay treatment of what is really wrong. The nurse is entrusted with the administration of medicines, and this is sufficient responsibility. Nurses are not

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[1] American Nurses' Association, Development of Statements of Functions, Standards and Qualifications for Practice, *The Yearbook of Modern Nursing 1957–58* (New York: Putnam, 1958), p. 336.

[2] *Ibid.*, p. 361.

qualified to prescribe; prescribing is not considered a nursing function and could be considered illegal practice of medicine.

So much for prescribing. What about dispensing?

Such activities as going into a pharmacy or store cupboard of stock drugs, preparing a drug which is ordered, putting it into a container, labelling it, and giving it to a patient comprise dispensing.

In doing this, the nurse is practicing something for which certain preparation is required and for which a license generally is required according to the Pharmacy Act. The dispensing of drugs and allied functions are sufficiently important for each state and province to have a Board, a Council, or a College of Pharmacy whose function it is to regulate the practice of pharmacy in the interest of public welfare.

You would be well advised to examine the Pharmacy Act of the state or province in which you are working to determine who may legally dispense prescriptions. Most Pharmacy Acts, I believe, require a qualified pharmaceutical chemist for this purpose.

The area of drugs is a very complex one. For example, drugs come in several different dosage sizes; they come in different forms for administration by different channels; they each have an official or generic name but may be ordered by any one of a number of proprietary or trade names; and there are certain legal requirements as to the labelling. Nurses are not prepared for the dispensing of drugs; it is not considered a nursing function and in many situations and instances might be considered illegal practice of pharmacy and unsafe for the public.[3]

However, you are interested in suggestions regarding the situation in which we as nurses, no doubt, will continue to find ourselves for some time to come.

There are many indications that professional growth is bringing more legal responsibility to the nurse, and for her own protection every nurse should be aware of this responsibility. This necessitates an understanding of the Nurse Practice Act of the particular state or province in which she is working and of the functions of a nurse. She should understand that the right to diagnose, pre-

[3] G. F. Archambauet, Legal Considerations, *Hospitals, 32:* 56, 1958.

scribe, or dispense cannot be conferred upon her simply because these demands are made of her in a given situation. Harrison states: "It is only as routine standing orders are formulated by one or more duly licensed physicians that the nurse has a legal right to proceed with more than first aid or emergency treatment." [4] Even with standing orders the nurse is expected to exercise a good deal of judgment, for at all times she is legally as well as morally responsible for any act or omission which is harmful to the person in her care.

In a situation, such as a college health service, where the nurse is often alone, she is well advised to have definite policies on therapy in various specific situations and conditions established in writing and signed by the medical director. She should see that she has sufficient medical direction and protection for what she is expected to do and that she is not violating the Medical Practice Act.

Policies regarding the dispensing of drugs should be clarified. Every possible means for providing essential pharmaceutical services in the interest of patient safety and welfare should be explored. It is recognized that such services are limited by a lack of finances, qualified personnel, and space facilities, but too often the service is lacking because administrators and the nurses themselves are not aware of the responsibility involved.

There are a number of possibilities: (1) an arrangement for a part time service, (2) an arrangement for service by a retail establishment, and (3) a cupboard stocked by a pharmacist with prescription-sized preparations which are correctly labelled and kept airtight and preferably in a cool place. This cupboard would have a regular audit by the pharmacist, who would also provide for the nurse a list of the stock, complete with the generic and proprietary names.[5]

One could, I am sure, find other suggestions in various pharmaceutical, hospital, and industrial health publications. I think that, if we are sufficiently aware of where our functions cease and at

[4] Gene Harrison, *The Nurse and the Law* (Philadelphia: F. A. Davis Co., 1945), p. 247.

[5] R. G. Henry, Emergency Drug Room a Versatile Solution, *Hospitals, 32:* 58–60, 1958; M. Kent, Drug Cabinet Lightens Nursing Burden at Night, *Hospitals, 32:* 61–62, 1958.

the same time are sufficiently concerned with our patient's needs, we can, with sound information and a reasonable approach, get some action. There are at least three groups of persons concerned here: doctors, pharmacists, and nurses, with the patient the focal point of consideration. State Boards or Councils of Pharmacy have a legal and moral obligation to see that citizens receive adequate and safe pharmaceutical service, just as the doctor and nurses are responsible for treatment and care. The doctor prescribes, the pharmacist dispenses, and the nurse administers. There is need for closer co-operation and liaison between these groups in the interest of those they serve.

Ocular Injuries Occurring in Athletics*

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THE subject of eye injuries as they occur in athletics is apparently not a popular one. A review of the usual ophthalmic journals for the past ten to fifteen years found no article dealing with the problem. The only textbook reference was a short paragraph in Duke-Elder's classic work. The most likely explanation for this paucity of reports seems to be that serious ocular injuries are not very common in organized athletics and the injuries themselves are not really different from those found in other accidents.

Industry on the other hand has been a prolific source of eye injuries. To combat them, intensive safety campaigns have been instituted, and the results have been truly remarkable. The possibility of insisting on a few simple safety rules for sports will be discussed later.

Besides a discussion of preventive measures the purpose of this paper is to make possible the rapid evaluation of injuries, so that those requiring the care of an ophthalmologist may be screened from those that will heal without special care.

INJURIES

Injuries will be discussed on an anatomic basis as follows: (1) orbit, (2) lids, (3) globe, and (4) brain (post concussion effects).

* Presented before the Section on Athletic Medicine, American College Health Association, Thirty-eighth Annual Meeting, Toronto, April 28, 1960.

Injuries of the Orbit

Although only a small part of the body surface is concerned, any blow in this area can cause potential trouble. In sports the blow may be from a fist, elbow, baseball, and so on. Bony protection is provided by the heavy orbital margin, and the eye is cradled by the extraocular muscles and orbital fat so that it can recoil within the protecting limits of the orbital margin. The weak points of the orbit are in its floor and on the nasal side. Fractures commonly involve the infraorbital canal below and the lacrimal or ethmoid bones nasally.

The diagnostic points to look for are: (1) displacement of the orbital rim as found by careful palpation; (2) crepitation on blowing the nose, which indicates an opening from the maxillary sinus, lacrimal duct, or ethmoid sinuses into the subcutaneous tissues, due to a fracture; (3) diplopia, which may be due to downward displacement of the orbital floor, to a detachment of the trochlea, or to paralysis of the third, fourth, or sixth cranial nerves. Detachment of the trochlea is seen occasionally as a boxing accident. If there is any suspicion of an orbital fracture, do not hesitate to have an x-ray taken.

Injuries of the Lids

The diagnosis of lid injuries is obvious and requires no discussion. Lacerations through the lacrimal duct or through the lid margin are best handled by an ophthalmologist. Epiphora or a notching of the lid margin which may occur after operative repair of an injury are not well received by any patient and may be a source of future malpractice litigation.

Injuries of the Globe

Injuries may be due to the concussion effect of a blow by a dull object such as a tennis ball, the lacerating effect of a sliver of glass, or a combination of the two.

Lacerations which do not penetrate the cornea are usually easy to diagnose and treat. Penetrating wounds, on the other hand, are usually serious and may be so small as to be easily overlooked.

If the wound is large, the aqueous humor will escape and often

the iris will be carried along and either prolapse or become adherent to the corneal wound. Therefore, look for a shallow anterior chamber or a distorted pupil.

Very small penetrating wounds may seal over quickly and show only a small track through the cornea, a small hole in the iris, or possibly a localized lens opacity. The hole in the iris is the easiest of these changes to see. Cataract changes in the lens may be slow to develop and may lie in the periphery and be seen only through a widely dilated pupil.

Concussion effects may vary from minor injury to the iris to rupture of the sclera or even avulsion of the optic nerve. Under the impact of a sudden blow the eye, acting like a tennis ball, will be compressed along the anteroposterior axis. The sudden recoil expansion following the compression may add to the damage and encourage hemorrhages and exudate formation.

Hemorrhage into the anterior chamber is usually quickly absorbed with no permanent defect, but because recurrent hemorrhages do occur occasionally and may be very serious, every hyphema should be treated expectantly and closely watched.

Paralysis of the iris in either a segmental or a uniform manner will result in a partly dilated pupil which may be irregular or even show a tear at the pupillary margin. Recovery is usual, but occasionally the defect is permanent.

The lens may be dislocated either into the vitreous or forward into the anterior chamber by the recoil wave of relatively negative pressure. The dislocated lens may be easily overlooked at first glance. Cataract formation can occur as a late change even in a nonpenetrating wound. The pigment imprint of the pupillary margin of the iris may often be seen on the lens surface.

The vitreous may be cloudy because of hemorrhage into it from the retinal vessels. Localized retinal hemorrhage and exudate may be seen with later pigment migration and clumping. Exudate in the macular area (Berlin's edema) can be difficult to see but invariably reduces visual acuity.

Retinal detachment may be caused by subretinal exudates without any actual retinal tear. These usually subside without surgery.

Injury of the Brain

Postconcussion effects are a delayed result of mild brain damage. They include persistent headache and difficulty in concentrating and in performing finely co-ordinated activities such as reading. All measurements of acuity, accommodation, and muscle balance may be normal, but reading for more than a short period may be very uncomfortable. Fortunately this situation usually clears quickly, for no treatment does much good.

SAFETY MEASURES

The most important single safety measure introduced by industry was the insistence that everyone who works around machinery wear safety glasses. In sports this means that any participant who must wear glasses in order to see should wear only safety glasses. This is particularly true in intramural sports where supervision may be lax. Supervisors of varsity sports usually insist on players' wearing guards and safety glasses. Most of the penetrating eye injuries seen at Cornell have been due to broken glasses, and all of them occurred outside of the varsity sports program.

The question of excluding some people from contact sports because of eye conditions has been raised. If a person has had retinal detachment surgery, he should be excluded, although one professional wrestler returned to his wrestling soon after successful surgery for retinal detachment with no ill effects to date. On the other hand, I have seen a twelve-year-old boy suffer a redetachment on being hit by a football.

One-eyed individuals, provided the remaining eye is normal, probably should not be excluded from sports except boxing or other equally dangerous ones.

When glasses must be worn and ordinary ones are impractical, contact lenses are both safe and practical. They are expensive and may require considerable fitting, but for football they are the best solution. Being made of plastic and being slightly flexible, they tend to absorb some of the blow, spread the pressure, and prevent small flying objects from penetrating the cornea. The

molded Lacrilens type may be a little more difficult to fit and not as easily tolerated, but also it does not dislodge easily. You are all familiar with the frantic time out while some player searches on his hands and knees for that nearly invisible corneal contact lens. The molded lens does help prevent this accident.

SUMMARY

Diagnostic points requiring further study and consultation are: (1) obvious fracture of orbit felt by palpation, (2) diplopia, (3) crepitation of lids after blowing nose, (4) laceration of lid margin or lacrimal duct, (5) loss of anterior chamber, (6) hyphema, (7) fixed or distorted pupil, and (8) loss of visual acuity.

Prevention of eye injuries may be accomplished by the use of: (1) safety glasses with guards if needed, and (2) contact lenses where preferable to glasses.

A Tuberculin Study in Harvard University Students, 1959-1960

ORRIN LEVIN, M.D., EDWARD J. WELCH, M.D., AND GLADYS MULLIN, R.N., HARVARD UNIVERSITY

IN a previous report we discussed the importance of carrying out a tuberculin case-finding study on the college campus.[1] Our tuberculin testing methods were described and our findings in the freshman class were presented. It is the purpose of the present report to describe certain changes in materials, dosages, and methods and to present our latest results.

In 1958 we used Purified Protein Derivative (P.P.D.) for tuberculin testing because it represented a highly purified complex of specific proteins dispensed as a well-measured compressed tablet—in theory at least, a standardized dose. After several months it became clear that in using P.P.D. we were not giving a standardized dose to each patient. The 5 ml. syringes we used to measure the diluents were inadequate for accurate quantitative work. Moisture retained in the sterilized syringes and needles (all equipment was boiled between tests) must have diluted the tuberculin to some extent. There is evidence that P.P.D. once diluted and kept in a partly filled glass container loses much of its potency because of absorption by the glass. Add to this the difficult task of introducing exactly 0.1 ml. intradermally and one can see

[1] O. Levin, E. J. Welch, G. M. Mullin, A Tuberculin Study in College Freshmen, *Student Med.*, *8:* 137–144, 1959.

that our goal of a "standardized dose" of tuberculin was not being achieved.

In the present academic year (1959–1960) we have used a solution (1–2000) of old tuberculin (O.T.) prepared by the Massachusetts Public Health Biological Laboratory. This solution contains 0.05 mg. O.T. (International Standard) in each test volume (0.1 ml.), which represents five tuberculin units (5 T.U.) or one-half the strength used last year. Thus we had tuberculin in a solution of standard potency, ready to use. Additional advantages were stability (not less than six months) and minimal cost. The reduced dose (from 10 T.U. to 5 T.U.) eliminated the severe skin reaction occasionally seen.

Prior to this year we used a freshly boiled tuberculin syringe and needle for each test. This had several drawbacks. For one thing, sterilizing the equipment took up too much of our nursing assistant's time. Another disadvantage was the high cost and the large number of syringes and needles required. To obviate these drawbacks we used a multidose tuberculin syringe and a half-inch short bevel #26 platinum-iridium needle. This method involves the use of a partially filled tuberculin syringe (0.6 ml.–0.8 ml.) from which 1/10 of a ml. of tuberculin is injected intradermally.[2] The needle is withdrawn, its tip flamed to redness in an alcohol lamp, a drop of tuberculin is ejected and the operator is ready for the next patient.

Objection to the multidose syringe method has arisen, based on the possibility of transmitting homologous serum jaundice or other infections by its use. In a statement dated February 5, 1959, the American Trudeau Society Committee on Diagnostic Skin Testing, after reviewing the records of millions of intradermal skin tests, endorsed the multidose syringe method and stated that: "the needle should be sterilized between tests by heating the needle to redness in a living flame." The Committee pointed out the experience of one university group testing an average of 7,500 students each year for ten years. Only one case of hepatitis was reported, that of a medical student who had contact with infectious hepatitis.

[2] *Tuberculin Testing Handbook* published by the National Tuberculosis Association, 1790 Broadway, New York 19, N.Y.

TUBERCULIN STUDY

Our tuberculosis case-finding program this year has been enlarged in an effort to reach more of the University community. As many students, faculty members, and service personnel as possible were urged to accept a tuberculin test. "Selling" the program was made easier by the recent concern over the danger of exposure to ionizing radiation. We had fewer requests for chest x-rays than in former years from those who needed proof that they were free from communicable tuberculosis. Furthermore, the Massachusetts Department of Public Health will now accept a negative tuberculin test in place of the chest x-ray previously required of school personnel.

One of our secretarial staff spends part of each day cataloguing our results. A punch card with spaces for recording all pertinent data is used. The results are recorded in such a way that individual or group information may be found easily and quickly.

Most people who have had tuberculous infections, including those with active tuberculosis, will react to the intermediate strength (5 T.U.) dose of old tuberculin introduced intradermally.[3] We regard all those whose skin tests show 6 mm. or more of induration as positive reactors, and all of these are x-rayed. Careful measuring and recording of all positive reactions has been stressed, since more tuberculosis develops among persons with big reactions to tuberculin than with small reactions.[4] An annual x-ray is planned for those with reactions of 10 mm. or more.

In the fall of 1959, 2,627 students, all but a few of whom were new to the University, were skin-tested. Last year we sent out a note explaining the tuberculin test and asked for 100 per cent participation; 5 per cent of the students refused. This year we simply included the test, along with other routine screening measures, as part of an initial medical examination and obtained 100 per cent participation. This year 2 per cent failed to return for a reading of their tests in forty-eight hours. Last year 5 per cent failed to report back for a reading.

Table 1 presents the results of our tuberculin testing in the

[3] C. E. Palmer and L. E. Bates, Tuberculin Sensitivity of Tuberculous Patients. *Bull. World Health Organization, 7:* 171, 1952.

[4] Report of the American Trudeau Society Committee on Diagnostic Skin Testing, Chicago, May 24, 1959; personal communication from Dr. Michael L. Furcolow, June 23, 1959.

Table 1. Results of tuberculin testing at Harvard University, 1959–1960

	No. tested	Positive	Negative	Incomplete
Freshman class:				
American-born	1,176	32 (*2.7%*)	1,128	16
Foreign-born	62	13 (*21.3%*)	48	1
Combined	1,238	45 (*3.6%*)	1,176	17
Upperclassmen:				
American-born	321	22 (*6⅔%*)	290	9
Foreign-born	34	11 (*33⅓%*)	21	2
Combined	355	33 (*9.3%*)	311	11
Graduate students:				
American-born	782	86 (*11%*)	685	11
Foreign-born	252	149 (*60%*)	99	4
Combined	1,034	235 (*23%*)	784	15
TOTAL	2,627	313	2,271	43

academic year 1959–1960. Two and one-half per cent of our American-born freshmen were tuberculin positive as compared to 5 per cent the previous year. This year only 21 per cent of our foreign-born freshmen were positive reactors; the previous year, 30 per cent.

Table 2 presents the number of positive reactors in the various age groups of American- and foreign-born students for both years. Here we find a comparable drop in the 1959–1960 percentages for all age groups. We have been able to reach no conclusion as to the significance, if any, of the smaller number of positive reactors in the later year. On the other hand, the number of positive reactors in new admissions to colleges and universities in the United States is known to vary from 1 to 25 per cent, with a majority of schools reporting 3 to 6 per cent.[5] Among the variables affecting reported results are the testing material, the geographic and socioeconomic distribution of the student body, and the variable interpretation of the marginal reactions by different observers.

[5] Personal communication from Dr. Max Durfee, Chairman of the Tuberculosis Committee, American College Health Association, May 18, 1960.

Table 2. Positive reactors in the various age groups, a comparison of two years' testing

Students 1959–1960	15–19	20–24	25–29	30–39	40+	Total positive
American-born	36 of 1219 (2.7%)	43 of 640 (7%)	23 of 208 (11%)	25 of 133 (19%)	12 of 35 (34%)	139
Foreign-born	16 of 75 (21.3%)	55 of 109 (41%)	52 of 89 (58%)	44 of 66 (67%)	7 of 10 (70%)	174
Combined	52 of 1294	98 of 749	75 of 297	69 of 199	19 of 45	313 of 2584
Students 1958–1959						
American-born	57 of 1075 (5%)	81 of 659 (12%)	39 of 238 (16%)	37 of 116 (32%)	18 of 35 (51%)	232
Foreign-born	26 of 81 (30%)	41 of 73 (56%)	46 of 71 (65%)	37 of 48 (77%)	8 of 11 (72%)	158
Combined	83 of 1156	122 of 732	85 of 309	74 of 164	26 of 46	390 of 2407

The only case of active pulmonary tuberculosis discovered by our testing was an American-born graduate student. (Two graduate schools at Harvard, not included in our figures here, have been testing new admissions. In each school one active case of pulmonary tuberculosis was discovered in the present academic year.)

SUMMARY

1. Changes in the tuberculin testing methods at Harvard University have resulted in an increased acceptance of the test, lower cost, and less work.

2. Inclusion of newly admitted upperclassmen and graduate students in the program confirmed the increasing incidence of positive reactions with increasing age.

3. Foreign-born students continue to have a higher rate of tuberculous infection than American-born students.

4. Our program discovered one active case of pulmonary tuberculosis, in a graduate student.

It is felt that a university health service should assume the responsibility for discovering any active tuberculosis present in the entering students. It is hoped that our present program may be extended to include an annual survey of the entire student body. Only by such a comprehensive program can the ill student be brought to early, effective treatment and the rest of the collegiate community be protected from infection.

Surgery in College Health Services*

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AMIDST the great number of relatively minor conditions encountered in a college health service practice one can at times lose sight of the considerable number of major diseases with which students are afflicted. Actually, many potentially serious conditions such as appendicitis, trauma, and certain forms of infection have a higher incidence rate among individuals of college student age than among the general population.

The following summary of patients treated for major surgical conditions at the University of Minnesota in the three years 1956–1959 is presented to emphasize the preceding statement, to stress that in our differential diagnosis of many dispensary cases we must consider the possibility of many surgical conditions, and to remind us that there are many interesting surgical problems that we could discuss with profit in the meetings of the clinical section of the American College Health Association.

Head and Neck Surgery

Our main concern here has been the early detection and radical treatment of cancer. In this period of three years two solitary nodules of the thyroid gland have turned out to be malignancies with widespread lymph-node involvement requiring total thy-

* Presented before the Section on Clinical Medicine, American College Health Association, Thirty-eighth Annual Session, Toronto, April 29, 1960.

roidectomy and bilateral radical neck dissections. An additional case has been encountered in the current year. The truth of the statement that all solitary nodules of the thyroid gland must be considered malignant until proven otherwise is confirmed. (See Table 1.)

Table 1. Head and neck surgery

	No. of cases
Thyroidectomy	8
Adenoma	5
Recurrent hyperthyroidism	1
Carcinoma (with radical neck dissection)	2
Excision branchial cleft cysts	2
Excision parotid tumors	2
Removal submaxillary gland	1
Removal thyroglossal duct cyst	2

Nose and Throat Surgery

Tonsillectomies are performed on students only if the patient is having frequently recurring upper respiratory infections, or prolonged complications from these infections, that interfere with his college activity. And they are performed only if grossly diseased tonsils can be demonstrated. (See Table 2.)

Table 2. Nose and throat surgery

	No. of cases
Polypectomy	6
Submucous resection	74
Tonsillectomy	62

The considerable number of nasal reconstructions is the result of trauma received in athletics or in motor vehicle accidents.

Thoracic Surgery

Although several different chest conditions have been encountered, the most common problem is spontaneous pneumothorax. In this period of three years twenty-nine cases were admitted with

this diagnosis; twenty-one showed less than 15 per cent collapse of the lung and could be treated conservatively. If the degree of collapse was more than 15 per cent or if considerable dyspnea was present, the condition could be quickly and easily rectified by inserting a small polyethylene tube through the second interspace anteriorly and creating suction through it by a Stedman Pump attached to a controlled negative pressure bottle. (See Table 3.)

Table 3. Thoracic surgery

	No. of cases
Thoracentesis	10
Empyema	1
Spontaneous pneumothorax	8
Traumatic pneumothorax	1
Parietal pleurectomy	2
Repair pectus excavatum	2
Lobectomy (bronchiectasis & lung abscess)	1
Bronchoscopy	7
Repair diaphragmatic hernia	1

Breast Surgery

Young women of college age have their full share of breast lumps, nodules, thickening, and matting. The incidence of carcinoma is low. Although not encountered in the past three years, it is occasionally found in an early phase if all discrete lumps are removed for biopsy. Most of these young women are well educated in matters pertaining to cancer, and the emotional relief that they obtain by removal of these discrete nodules is often remarkable. (See Table 4.)

Table 4. Breast surgery

	No. of cases
Fibroadenoma	24
Fibrocystic disease	16
Gynecomastia	8
Blue dome cyst	1

Abdominal Surgery

Acute appendicitis is the most common major abdominal condition encountered. The majority are acute unruptured cases of appendicitis. Eight per cent are either perforated or yield a positive peritoneal culture as a result of gross suppuration or gangrene in the walls of the appendix. And for every appendectomy performed seven cases of potential appendicitis are seen in consultation by a surgeon. (See Table 5.)

Although many cases of peptic ulcer are seen in the dispensary and twenty-seven cases of bleeding ulcers have been admitted to

Table 5. Abdominal surgery

	No. of cases
Appendectomy	126
Acute	109
Other conditions	17
Bleeding corpus luteum	1
Mesenteric adenitis	5
Regional ileitis	1
Incidental	3
No diagnosis	7
Gastrectomy	2
Bleeding ulcer, acute	1
Bleeding ulcer, recurrent with partial obstruction	1
Biliary tract surgery	7
Cholecystectomy (2 with C.D. expl.)	5
Chronic cholecystitis & lithiasis	4
Chronic pancreatitis	1
Biliary tract surgery	2
Transduodenal sphincterotomy	1
Plastic on common duct (stenosis)	1
Lysis of small intestinal adhesions	
Acute obstruction	2
Resection of small bowel	
Regional ileitis	2
Congenital malrotation	1
Meckel's diverticulectomy	2
Resection colon (carcinoma)	1
Miscellaneous	
Splenectomy (ruptured spleen)	1

the hospital in these three years, surgery has been necessary on only two occasions. The vast majority of bleeding ulcers in these young people seem to be able to be controlled promptly by the use of a skimmed milk drip and medication.

Surgical conditions of the biliary tract and of the other viscera are not common but occur with sufficient frequency to require alertness on the part of the examining physicians.

Urological and Gynecological Surgery

Conditions of the genitourinary tract requiring surgery present themselves in multiple forms with the frequency that would be expected in this age group. Actually, the main burden in diagnosis and treatment in these two fields rests in hands of the urologist and gynecologist working in the specialty clinics. (See Tables 6 and 7.)

Surgery for Miscellaneous Conditions

The familiar painful thrombosed hemorrhoid is encountered frequently in the dispensary and is cared for by incision under local anaesthesia and evacuation of the clot. Some cases of hemorrhoids and fistulae require corrective surgery as listed. (See Table 8.)

Pilonidal abscesses are seen quite frequently and are cared for by incision and drainage, with total excision being performed at a time that is more advantageous to the student. Simple drainage, curettage, and marsupialization, however, seem to give results

Table 6. Urological surgery

	No. of cases
Orchiopexy	2
Orchiectomy	4
Insertion prosthesis	1
Repair hydrocele	8
Ureteroplasty	2
Meatotomy	3
Ureterolithotomy	1
Nephrolithotomy	1

Table 7. Gynecological surgery

	No. of cases
Removal of ovarian cysts	11
Simple	4
Hemorrhagic	2
Dermoid	1
Pseudomucinous	2
Endometrial	1
Cystadenoma	1
Salpingo-oophorectomy	
Abscess	1
Hysterectomy-fibroids	2
D & C	42

Table 8. Miscellaneous surgery

	No. of cases
Hemorrhoidectomy	26
Fistulectomy	23
Pilonidal cystectomy	95
Herniorrhaphy	65
Indirect	58
Direct	5
Femoral	1
Ventral	1
Saphenous ligation & stripping	20
Tendon repair	9
Operations on skin—major lacerations	52
Lymph node biopsies	14
Repair facial nerve	1
Removal spinal cord tumor	1

almost comparable to the excision procedure. We have our share of recurrences or unhealthy healing, and they seem to be more common than is usual in private practice. Factors that may be responsible are the difficulty students have in carrying out cleansing regimes two or three times a day due to their heavy schedules and the fact that a considerable amount of their time is spent sitting

on hard seats in lecture rooms which results in pressure interference with circulation in the healing area.

In addition to the conditions that have required the major procedures listed, there are multiple other surgical conditions which require care on an outpatient basis. These range from the ever present sebaceous cyst or mole through a massive number of infections including paronychia, staphylococcal abscesses, and ingrowing toe nails to the multiple traumatic conditions which an active youth is inclined to develop. We have found that prompt and proper care of these conditions will result in the prevention of much more serious conditions as well as a great time and financial saving for both student and health service.

Danger Spots on Campus*

GUSTAVE L. SCHEFFLER†

TWO methods can be used to identify hazardous areas or activities on college or university campuses. The first is to engage an expert to make a survey, the primary purpose of which is to discover hazards that can produce "catastrophe-type" accidents. A catastrophe-type accident is one that is able to cause death, dismemberment, or permanent disability to one or more people. Fortunately, the frequency of such accidents is usually low. When one does happen, it receives publicity, usually all bad, and makes a lasting mark on the conscience of the person or persons who feel it could have been prevented. The loss of life from a fire flashing through an unprotected, frame, barracks-type dormitory is a typical example.

The second method of detecting danger spots is to make a realistic study of accident reports. If accidents are reported and summarized, a proper study will reveal danger spots. This method, of course, requires a certain number of accidental injuries before causes can be determined, and for this reason is inappropriate in studying causes of catastrophe-type accidents; it is hoped that safety surveys will discover and allow for the correction of such highly dangerous hazards before they can appear on a report form. The danger spots toward which accident reports should direct attention are those that produce a high frequency of minor injuries. In many activities a high frequency of minor injuries can be taken as a warning that more severe injuries will follow. How-

* Presented at the annual meeting of North Central College Health Association, LaCrosse, Wisconsin, April 22, 1960.

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ever, the statement that "severity follows frequency" is only partially true. During the past two years a total of ninety-six students were injured accidentally in the University of Minnesota chemistry laboratories. Fifty-seven had hand cuts caused by the accidental breaking of glass tubing. The injuries were annoying but never serious. The similarity of these injuries resulted in some of our health service physicians merely recording as a diagnosis, "glass tubing syndrome."

Experience has shown that unless some unusual circumstance occurs simultaneously, a relatively high frequency of broken-glass-tubing accidents does not have the potential of producing a death, dismemberment, or similar serious injury. On the other hand, the same number of hand cuts suffered in shop accidents from the use of power woodworking tools would be a cause for real concern, for experience has shown that if the causes of power-tool injuries are not eliminated, amputations of fingers and hands will occur. These two examples not only illustrate that severity does not always follow frequency but in addition emphasize the need for a realistic study of accident reports.

By use of the two methods mentioned, three areas will be found to be danger spots on the college campus. The athletic field and gymnasium floor form the first such area. Many athletic activities involve body contact and can be expected to produce some minor injuries. But this fact alone does not justify our calling athletic fields and floors a major danger spot. An accident survey was conducted jointly by the American College Health Association and the National Safety Council during the years 1953–1954 and 1954–1955, with eleven colleges and universities participating. This survey indicated that 55 per cent of the on-campus injuries were the result of athletic activities. The experience at the University of Minnesota in the succeeding years produced an almost identical rate of athletic injuries (54 per cent). This frequency is the result of accidents caused by poor field conditions, crowded or confined activities, inadequate rules, poor or ineffective officiating, and improperly designed protective equipment.

During two consecutive years a reduction of 7 per cent in the yearly totals of accidental injuries was achieved by better maintenance of University of Minnesota playing fields. Crowded condi-

tions recently caused a potentially serious head injury. Because of inclement weather, a track meet and football practice were being conducted simultaneously in the relatively confined quarters of the field house at Minnesota. A football player was accidentally hit with a sixteen-pound shot. Although hospitalized, he fortunately made a rapid recovery. Rules allowing players to engage in heavy direct-contact sports, such as football and hockey, without wearing adequate protective equipment, headgears in hockey and mouthpieces in both sports, produce serious injuries each year. These vary from loosening or loss of teeth to minor concussions; in one case a skate blade pierced a player's brain. Intramural football played with rules that do not compensate for the lack of the protective equipment worn in the varsity activity will likewise produce more injuries than expected or desired.

A college or university having an extensive intramural program will discover that it is a major contributor to the total number of athletic injuries. Minnesota's strong intramural program is responsible for 42 per cent of all athletic injuries. A study of intramural injuries for the year 1958 showed that football, basketball, baseball, and hockey rank in that order as accident producers. Some of the causes of injury were failure to provide or to use proper protective equipment, wearing of improper footgear, and failure to add support by taping or wrapping ankles or other parts of the body subject to injury. One way to reduce the number of intramural accidents is to study the rules, initiate the needed modifications that will control the possibilities of body contact, and then be sure there is strict enforcement of these rules by competent officials.

Physical science laboratories, particularly those used by research personnel, are the second danger spot on the campus. Serious fires and explosions in laboratories of this kind have occurred in almost every college or university. During the past year, at Michigan State University, there was an explosion in a chemistry laboratory that killed one person and seriously injured three; at Purdue a liquid oxygen tank exploded, demolishing one section of the research building; a year and a half ago at Minnesota there was a $500,000 fire in the chemistry building. This is not a complete

list, but these examples are sufficient to establish the fact that the problem exists.

The danger of handling chemicals, flammable liquids, and toxic and explosive materials should be apparent to everyone. However, if such materials are used frequently, it is relatively easy to forget the inherent danger and omit necessary safety procedures. Gasoline is certainly a very flammable and explosive liquid, yet due to the public's familiarity with this particular liquid, it is continually handled or used in an unsafe manner. Considering the common disregard for this hazardous solvent, it can be understood how familiarity breeds contempt for similar solvents in the laboratories.

Combine the inherent hazards of the materials used in research, whose hazardous properties often are unknown, with the crowding of these activities into grossly inadequate building space, and you have created a real danger spot. A survey of the university and college laboratories should reveal such danger areas. This will be further supported by accident reports. The joint report mentioned previously placed laboratories in third place as a contributor to on-campus accidental injuries—our experience at Minnesota moves them into second place.

I mentioned that research laboratories are a special danger spot, and I would like to enlarge on that statement. It has been my experience, and that of many other safety engineers, that a paradox exists in this particular area. The paradox is the fact that people of high intelligence, who know and should understand how to follow safety procedures, act in a manner or allow conditions to exist that would frighten even the newest freshman. Dedication to a goal, regardless of cost or consequence, combined in many instances with a feeling that safety rules were made to protect the less intelligent, often make the graduate student and research fellow less regardful of safety precautions. Research, without administrative supervision and strict enforcement of safety regulations, is the constant worry of a college or university safety director.

The third danger spot on the college campus is actually a collection of small individual danger spots combined under the term "walking surfaces." Included in this term are sidewalks, outside steps, interior floors, and stairs. In most instances the complete

network of sidewalks and floors should not, or will not, be danger spots. Accident records can be successfully used to locate the specific danger areas; visual inspection should also help. Broken or uneven sidewalks, improperly designed stairs and steps, stairs or steps that have become worn or slippery through use are some of the items for which to look.

Winter weather, as experienced in the northern part of the United States, can convert almost all outside walk areas into danger spots. Even with a good system of snow removal, salting, and sanding of walks, pedestrian injuries increase about 30 per cent during the winter months on the University of Minnesota campus. In the spring there will be areas where the earth has been removed or depressed near the edge of the sidewalks, thus producing tripping hazards. On every campus there will be some steps without handrails or with broken treads or worn nosings. These conditions combine to cause a high number of falls and a proportional number of sprained ankles and bruised knees. Fortunately, the age bracket of the exposed population limits the results of most of these accidents to minor injuries. The severity increases considerably when an older member of the faculty suffers the same type of accident.

Fads, too, can create or add to danger spots. The current fad among students, particularly girls, of wearing tennis shoes has had an effect on the accident picture. These rubber-soled sneakers have been a factor in increasing the number of falls, during wet and icy weather, on sidewalks and steps.

Interior floor surfaces can be danger spots. Highly polished terrazzo and asphalt tile, particularly when protected with wax of high carnauba content, present a pleasing appearance but increase the incidence of falls. If the newer plastic finishes are used, the floors can be buffed to an attractive gloss and still provide a high coefficient of friction that will almost eliminate falls due to slipping. Interior stairs that are not provided with antislip nosings or with handrails will be danger spots. The nearer such stairs are to outside entrances where water, snow, and ice can be tracked onto them, the greater is the chance of their being such a danger spot.

The shops used for industrial education, agricultural engineer-

ing, and other engineering activities might be expected to be danger spots. Experience has not proven this to be true. The students' awareness of the potential hazards of the tools and a conscientious effort by the instructor to see that such tools are properly used may be factors in holding down the number of accidents in these areas. The joint survey reported relatively few accidents in shops, and our experience at Minnesota bears out this fact.

Three specific danger spots on the college campus have been discussed. They surely exist on all campuses, except where there are no athletic activities, no sidewalks, no laboratories, or where there is an exceptional maintenance program combined with an active safety program. The areas and activities to be mentioned next may not be common to every campus. Where they do exist, they will produce a frequency and severity of injuries which place them in the danger-spot category.

Large lecture rooms, laboratories, or places of assembly which have only one exit are danger spots. This is especially true when these rooms are located at the end of corridors some distance from the nearest open stairwell. Recent experimental work in Los Angeles revealed that smoke and heat can make open stairwells untenable within two or three minutes after a fire breaks out at a lower level. The loss of life that can be caused by these conditions combined with panic makes such rooms and buildings danger spots.

Field houses and auditoriums which can accommodate large numbers of people should receive special attention because of the life-threatening problems in an emergency situation. Many of the older structures of this type were provided with exits insufficient in proportion to their total seating capacity. If overcrowding of any field house or auditorium is allowed, it is not difficult to understand that considerable loss of life could occur should an emergency result. Another problem results if students attempt to get into athletic activities or concerts by having friends open emergency exits for them. Since this causes a small loss of revenue, a common practice has been to secure these emergency exits by means of locks, bars, or other devices. A thinking person immediately recognizes that a danger spot has been created.

It is not difficult to create danger spots even in a building that is well designed and fire resistant. Consider, for example, the decorations used for a dance in a modern student union or gymnasium. These decorations are often flimsy untreated cloth and paper. It is not uncommon to provide complete false ceilings of such highly flammable materials as cheesecloth, to use Kleenex for decorating light fixtures, and to use straw and dry cornstalks for additional decoration. A cigarette or burning match is all that is needed to start a fire that would flash from one end of the room to the other, completely enveloping all occupants in a blazing inferno. You have read of such instances in newspapers or can recall a personal experience where such fires have occurred on college and university campuses. If such materials are to be used for decoration or as stage props, the amount should be limited, and they should be properly treated with flame retardant, and fire extinguishers should be readily available.

Still another danger spot is extracurricular student activities which may take place off the campus under either full or partial college sponsorship. Some of the activities which are inherently hazardous are sky diving, mountain climbing, skiing, and tobogganing. Sky diving is gaining in popularity among university students. In this sport the sky diver is flown to heights up to 10,000 feet; from this height he jumps and, with the aid of cloth stretched between his legs and from his arms to his body, he glides in a free fall to an altitude of around 2,000 feet, where his chute is pulled to assure a reasonably safe descent to the ground. A second activity, mountain climbing, was begun this past spring at Minnesota; certainly an unexpected activity at a midwestern university. Its hazards are obvious when natural areas are used. At the moment, however, the walls of the football stadium are being used for the practice area; this has added some additional problems, such as the possible insufficient strength of guard rails and other structural members that are used for tying off. Skiing and tobogganing in the winter and water skiing and skin diving in the summer are very popular but require stringent regulations, adequate training, and constant supervision to prevent serious injuries.

Athletic facilities such as swimming pools and gymnasium equipment may become danger areas if they are made available

for unscheduled use by students, faculty, or their families. It is extremely important that adequate supervision be provided for pool areas and around such gymnasium equipment as trampolines. The practice of leaving any gymnasium open for the unsupervised use of gymnastic equipment is very hazardous.

All danger spots on the college campus have not been mentioned. Perhaps some serious ones have been overlooked. By using surveys and accident-report analyses, they can be found. The health service should take an active part in seeing that this is done.

The size and activities of health services vary widely. Some are large and have comprehensive programs, so that they are able to accept full responsibility for campus safety. The smaller health services usually cannot accept such responsibility. In any case, accidental injuries are a health problem, and efforts should be made to see that all such injuries are seen by the health service. The treatment may vary from first aid or treatment of injuries not requiring hospitalization to complete treatment including hospitalization. The basic purpose of the health service, the legal responsibilities of the college, and the desire to keep students fit for study, all decree that every on-campus injury should be seen by the health service. Then, completion of a simple report form is the additional step needed for the adequate reporting of such injuries.

The safety survey is not a responsibility usually associated with the health service, but large universities should consider it as such, just as accident prevention is accepted by various state and local health departments as part of their responsibility in maintaining the health of the community. On small campuses a nurse or part-time physician may recognize the need for surveys and, since no one else will accept the extra duty of arranging them, accept it himself. The great majority of campuses come in between these two extremes, and the health service, its director, and its staff personnel should encourage the establishment of proper safety organizations, which would include regular surveys of the campus and college activities.

The use of a consultant to assist the college or university in surveys and in establishing safety programs should not be overlooked. Full use of various governmental agencies should also be

incorporated into every college and university program. It is doubtful that such agencies can provide the complete program for any college or university, but the knowledge associated with their specialties can be very helpful. The state and city fire marshals and inspectors, state boiler and elevator inspectors, and labor and industrial department inspectors are some of the representatives of such agencies who can be utilized to good advantage.

When the services of a consultant or outside agency are used, it is important that the faculty and staff understand the purpose of the visits. To receive full value from such services, the faculty and staff should be advised and encouraged, not only to cooperate, but to mention and discuss any items they feel might be unsafe. All employees should understand that the unsafe conditions and unsafe procedures found will not be considered personal errors or faults. The sole purpose is to discover all hazards, so that action can be taken to prevent accidents.

This paper has pointed out some specific danger spots on the college campus and has suggested some methods of determining other danger areas. It is hoped that every college health service will take an active interest in seeing that danger spots on the campus are found and corrected.

Who Helps Whom? A Comparison of Client Groups at the University Psychiatric Clinic and the Guidance Bureau*

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AMERICAN universities are increasingly help-oriented, despite frequent protestations that we coddle and infantilize our young people. Several agencies are usual on a large campus, offering different types of help to various sorts of students, with differing reported results; utilizing heterogeneous terminology to describe their clients; espousing divergent theories of personality and of treatment; and proclaiming different although often vague criteria of change. Perhaps no great harm is done to anyone—unless to the professional who strives to bridge these gaps, and attain the *rapprochement* and co-operation that should ideally be obtained. Referral between agencies on the campus, full sharing of information, co-operation in improving the university milieu, free use of interagency consultation, joint endeavors in research: who would argue with these goals? And who can honestly claim that they have been entirely attained on his home campus?

But the purpose of this paper is not to endorse interdisciplinary co-operation. Rather, it is to report a start in defining the client

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populations that consult two of the helping agencies on our campus. Attempts at the University of Kansas to define *explicit* criteria for referral to one agency or the other have been largely unsuccessful. In essence, the *implicit* criteria seem to be something like this: bright students who complain of academic difficulty and with whom the referring person can empathize are referred to the Guidance Bureau (staffed by counseling psychologists), with the clear communication, "I don't think *you're* sick enough to have to see a psychiatrist." On the other hand, seriously depressed persons; those who have committed antisocial, violent, frightening acts; and those whose illness makes empathy difficult for the referring individual are sent to the Mental Health Clinic of the Student Health Service. The Dean of Students usually accepts responsibility for helping those who get in minor scrapes with authority or experience difficulty in adjusting to group standards of behavior. The religious counselors see those who have habitually found in religion a buttress for and extension of their own identity.

Do these groups, however, actually differ significantly in degree of pathology, severity of symptoms, ability to change, or degree of discomfort experienced or inflicted? Or is only the "ticket of admission" different? Might the same individual, then—depending upon chance rather than upon explicitly defined criteria—approach the Guidance Bureau with the complaint, "I don't know what I want to study"; see a general physician in the Student Health Service, complaining of headaches; then consult his minister about his doubts about God; shortly thereafter be placed on probation by the Dean of Men for repeated infractions of dormitory regulations; and then consult the Mental Health Clinic complaining of anxiety, self-doubt, and recurrent depression? In practice any combination and sequence of agencies is sometimes resorted to by a student casting about in his new and confusing milieu for someone who can help. The tendency of individuals to voice the complaints necessary to get attention from a helping person has been commented on previously in the literature.[1]

As a pilot study to examine the question, "How do patients

[1] A. M. Kasper, The Psyche Doctor, the Soma Doctor and the Psychosomatic Patient, *Bull. Menninger Clinic, 16:* 70–83, 1952.

seen by various helping agencies on the campus differ?" the following design was established:

All male clients seen for the first time at the Mental Health Clinic of the Student Health Service (staffed by a psychiatrist and two clinical psychologists), and at the Guidance Bureau (staffed by counseling psychologists) between September 15 and December 31, 1959, comprised the experimental groups. Comparisons between the two groups were made on the basis of a questionnaire completed by the interviewers after the initial interview, inquiring about the client's age, course of study, and presenting complaints; how he presented himself to the interviewer; characteristics of the interaction; and recommendations.

In addition, the Minnesota Multiphasic Personality Inventory (MMPI) was administered to the client groups; 100 MMPI profiles obtained from a randomly selected group of entering male students at the University (consisting almost entirely of freshmen) were used as a comparison group. The test results were compared along the following dimensions: (1) number of scales per profile elevated or depressed two standard deviations or more from the mean, (2) values obtained on the Barron Ego Strength Scale,[2] (3) values obtained for the Anxiety Index (AI),[3] and (4) values obtained for the Internalization Ratio (IR).[4]

RESULTS

Comparison of the questionnaires revealed the following differences in the client groups:

1. Clients at the Mental Health Clinic were distributed throughout the age range of the university population, whereas Guidance Bureau counselors tended to see the younger students.

2. Mental Health Clinic patients represented a broader cross-sample of the university population as regards course of study

[2] F. Barron, An Ego Strength Scale Which Predicts Response to Psychotherapy, *J. Consult. Psychol., 17:* 327–333, 1953.

[3] G. S. Welsh, An Anxiety Index and an Internalization Ratio for the MMPI. In Welsh and Dahlstrom, eds., *Basic Readings on the MMPI,* (Minneapolis: University of Minnesota Press, 1956).

[4] *Ibid.*

and included graduate students. The Guidance Bureau saw a high percentage of students in the School of Engineering.

3. Presenting complaints differed markedly. Patients consulted the Mental Health Clinic for a variety of problems, most of which were symptoms of internal discomfort, such as anxiety, unhappiness, and confusion. Ninety-five per cent of the Guidance Bureau clients presented a vocational-academic problem as their "ticket of admission." However, 25 per cent of the initial interviews at the Guidance Bureau explored primarily problems of an emotional nature, rather than vocational-academic indecision.

4. The client and the interaction of client and counselor were described almost invariably in a simple, plain-English, trait-descriptive manner; jargon and differing terminology were not a problem in communication between the two agencies.

5. Judging from the questionnaires, the Guidance Counselors were, or described themselves as being, much more accepting than were interviewers at the Mental Health Clinic, who questioned the motivation of almost one-third of the patients. Also, descriptions of patients as "evasive," "defensive," "intellectualizing," and "reluctant to elaborate" occurred often on the reports from the Mental Health Clinic; such attention to patient resistance was not apparent in the Guidance Counselors' reports.

It would appear that the role of a psychiatric patient, in our setting at least, is more demanding and more rigorously defined by the clinicians, than is the role of the counselee. The implications of this difference for interactional process and outcome are problematic.

6. The usual recommendation of the Mental Health Clinic was for a minimum of three more interviews, which were evaluative in nature. The Guidance Bureau almost routinely advised interest and aptitude testing, followed by counseling.

Comparison of MMPI's for the two client groups and a sample of entering freshmen yielded the following results:

1. When the distribution of profiles, based on the number of scales per profile that were two standard deviations or more from the mean, is compared, the Guidance Bureau clients are seen not to differ significantly from entering students, whereas Mental

Health Clinic patients have profiles that are more often deviant. (See Figure 1.)

2. Ego Strength was distributed similarly for Guidance Bureau clients and for entering students, with an identical mean of 48. Patients of the Mental Health Clinic, in contrast, were distributed more widely over the range of values, with a mean Ego Strength of 42.5. (See Figure 2.)

3. Anxiety Index scores are more spread out over the range of distribution for Mental Health Clinic patients, and their mean Anxiety Index is 44 as compared with 34 for the Guidance Bureau clients and 29 for entering students. (See Figure 3.)

4. The curves of distribution for Internalization Ratio show a tendency for more internalization of conflict among patients at the Mental Health Clinic. (See Figure 4.)

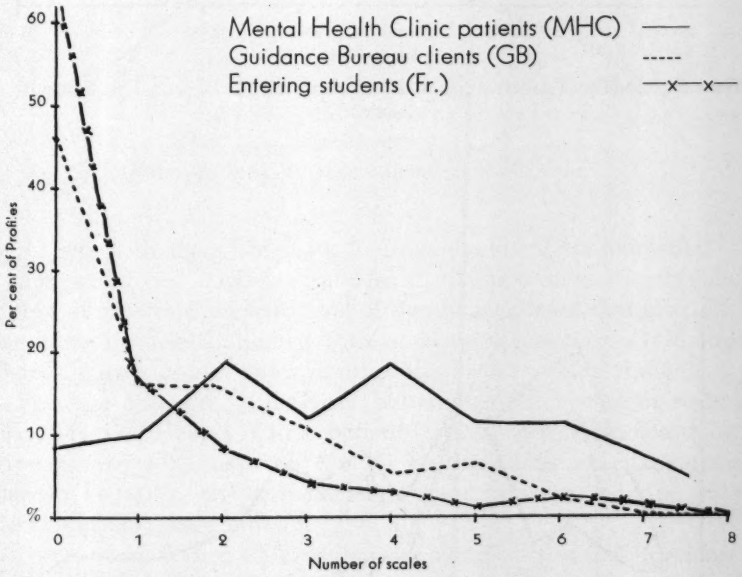

Figure 1. MMPI: Number of scales two standard deviations or more from the mean

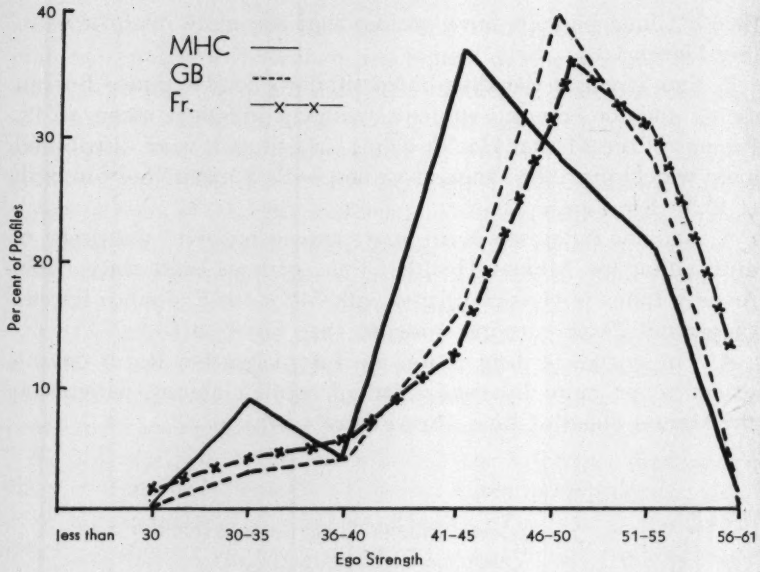

Figure 2. MMPI: Ego strength values (obtained on Barron Ego Strength Scale)

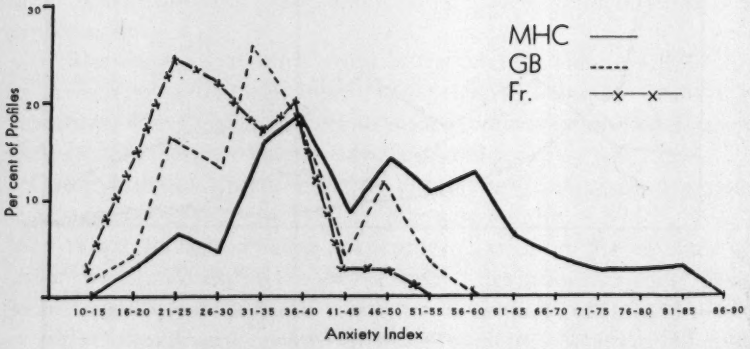

Figure 3. MMPI: Anxiety Index values

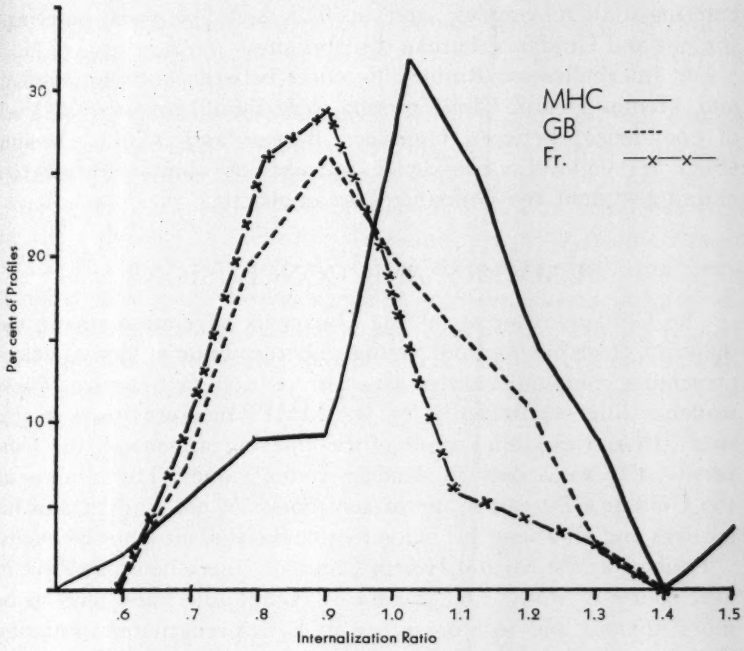

Figure 4. MMPI: Internalization Ratio values

Statistical analysis [5] of these findings disclosed the following:

For profile deviance, Mental Health Clinic-patient distribution differs at greater than 0.01 level of significance from that of entering students and Guidance Bureau clients; however, Guidance Bureau clients do not differ significantly from entering students.

For Ego Strength, differences between entering-student scores and Mental Health Clinic-patient scores were significant at greater than 0.01; between Mental Health Clinic and Guidance Bureau at 0.05; but were not significant between entering students and Guidance Bureau.

For Anxiety Index, differences were significant at 0.01 level between Mental Health Clinic and both Guidance Bureau and

[5] Tests used were analyses of variance and one-tailed t-test with Scheffe's modification.

entering-student samples; and at 0.05 level between entering-student and Guidance Bureau distributions.

For Internalization Ratio, differences between entering-student and Mental Health Clinic groups were significant at 0.01 level of confidence; between Guidance Bureau and Mental Health Clinic at 0.05 level of confidence; but were not significant between entering-student and Guidance Bureau groups.

SUMMARY AND CONCLUSIONS

The Guidance Bureau at the University of Kansas draws the majority of its clients from young undergraduate students, whose presenting complaints are of a vocational-academic nature. These students differ significantly, on the MMPI measures used in this study, from a random sample of the entering students of the University of Kansas only in Anxiety Index values. The climate at the Guidance Bureau is one of acceptance of the student and his motives and an attempt is made to give the student what he wants.

Patients at the Mental Health Clinic are more heterogeneous in age, course of study, and presenting complaint. They tend to be more anxious and to score lower in Ego Strength than entering students and Guidance Bureau clients. Interviewers at the Mental Health Clinic often question motivation, attend to signs of reluctance on the part of the student to become involved in a helping relationship, and define the role of patient more rigorously than do Guidance Bureau counselors. Interviewers at the Mental Health Clinic, then, tend to ask more of their patients, who are, by the measures used in this study, less able to "give" because of their greater anxiety and impaired Ego Strength.

This initial study does not attempt to answer the question of what happens to the very disturbed individual who goes to the Guidance Bureau, where he confronts the counselor with interactional problems that are of a different quality and magnitude from those the counselor is accustomed to encountering. Neither does this study attempt to define explicit criteria for the sorting or triage of individuals experiencing problems in living in order to ensure that each person goes to the agency best suited to meet his needs. Such criteria must be developed by further study, such

as comparison of outcome, more refined health-sickness ratings, and insight into how the client experiences his encounter with one or the other agency.

The use of such scientific data, when it emerges, will depend upon the particular situation existing on the campus: styles of interaction among agencies vary so widely that it is impossible to generalize. We should strive for a co-ordination of helping services in the university that ensures the fixing of some over-all responsibility and authority and allows for the assignment of differing helping roles to the various agencies, with explicitly defined operational criteria delimiting the various client groups. It is not enough to hope that the young, inexperienced college student will invariably, without direction, find the service that is most suited to his needs.

Health, Regulatory, Legal, and Technical Aspects of a University Program for Radiation Protection*

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A PROGRAM of radiation protection may find its justification in the health problems, the regulatory requirements, and/or the legal implications that are associated with the use of sources of ionizing radiation. The solution to these health, regulatory, and legal problems must be derived from an appropriate and effective integration of administrative procedures and technical applications. It seems appropriate, therefore, to discuss the broad and general health, regulatory, and legal aspects before indicating a few specific administrative procedures and technical developments that may be necessary for the conducting of an adequate radiation-protection program.

HEALTH PROBLEMS

The health problems or the biological effects of exposures to ionizing radiation are not unique. However, special consideration should be and is given to radiological problems by virtue of the

* Presented before the Section on Environmental Health and Safety, American College Health Association, Thirty-eighth Annual Meeting, Toronto, April 28, 1960.

fact that very small and undetected quantities of materials may produce large effects. These effects may be widespread, as was the case in the reactor incident at Windscale, England. The release of approximately 200 mg. of I^{131} resulted in the restriction of the sale of milk in a 200-square-mile area in England. It was estimated that only 100 mg. of I^{131} fell on British soil; consequently, there was less than $\frac{1}{2}$ mg. of I^{131} per square mile in the restricted area. However, the sale of milk from the cows grazing in the restricted area was prohibited for about a month; the cost of the contaminated milk that was poured into the ground was estimated at $250,000. The building and equipment contamination problems associated with the rupture of 40 mg. radium sources in New York (Keleket Incident) and California (Treasure Island Incident) have been estimated to have cost $250,000 to $500,000.

In these instances, although no serious health problems were reported, the potential for serious health problems was present. In general the health problems have been maintained at a relatively low level by virtue of adherence to the standards set forth for radiation protection. Natural radiation dose rates, maximum permissible dose rates, and the biological effects are presented in Table 1.

Table 1. Dose rate—conditions and effects relationship

Conditions and effects	Dose rate, in millirem/day
Natural radiation	0.35
Proposed EMPL*	1.0
Proposed OMPL†	20.0
Present licensee OMPL†	60.0
Past OMPL† (1930–1950)	100.0
Debilitation in 3 to 6 months and death in 3 to 6 years	1,000.0
Debilitation in 3 to 6 weeks and death in 3 to 6 months	10,000.0

* Environmental maximum permissible level.
† Occupational maximum permissible level.

The relationship of total dose to biological effects and to the maximum permissible dose (MPD) over various periods and under normal and emergency conditions are presented in Table 2.

Table 2. Total dose—conditions and effects relationships

Conditions and effects	Dose, in rem
Quarterly MPD*	3
Average annual MPD	5
Emergency MPD	25
Illness dose (blood changes, no deaths expected)	100
LD_{50} (30 days)	400
LD_{100} (30 to 60 days)	1,000
CNS disruption (death within minutes or hours)	10,000
Spastic seizure (death within seconds)	100,000

* Maximum permissible dose.

The doses to produce significant biological effects vary considerably with respect to the type of irradiation, the period of exposure, the person exposed, the quality of the irradiation, and many other factors. Some of the more acceptable values, although still open to question and qualification, are set forth in Table 3.

Table 3. Relationship of biological effect to dose

Effects	Dose, in rem	Comments
Genetic	30 to 50	Estimated dose to double the spontaneous mutation rate
Lifespan shortening	100	May reduce life span by 1%
Cancer (skin)	500	Value questionable and subject to qualification
Skin damage		
(Erythema dose)	100	Grenz rays
	350	100 kv-x-rays
	600	200 kv-x-rays
	1,000	1,000 kv-x-rays
	1,500	Radium irradiation
Blood changes	25 to 50	Blood count depressed
	25 (neutrons)	Presence of bilobed nuclei of the lymphocytes may be detected

REGULATIONS

The need for regulations has been supported on a broad basis by international, national, state, and city governmental agencies, for the need to protect the public from the hazards associated

with the use of sources of ionizing radiation has long been recognized. The basis of the American regulations are the recommendations on maximum permissible levels of radiation set forth by the National Committee on Radiation Protection and Measurements (NCRPM) in the *National Bureau of Standards Handbook, Number 59* (external exposures) and *Number 69* (internal exposures). The basic federal regulations have been formulated and promulgated by the Atomic Energy Commission (AEC). These regulations have been filed in the Federal Register under Title 10, part 20 which is also known as 10 CFR-20.

A summary of the occupational maximum permissible exposures (OMPE) upon which the regulations are based is presented in Table 4. The maximum permissible environmental exposure are one-tenth of the OMPE values set forth in Table 4.

Table 4. Occupational maximum permissible exposures

Affected area	External dose, in rem			Affected area	Internal dose rate and dose	
	QMPD*	AMPD†	CMPD‡		MPDR § in rem/wk	AMPD† in rem
Whole body	3	5	5 (N = 18) ‖	Gonads	0.1	5
Skin	6	10	10 (N = 18) ‖	All other organs	0.3	15
Extremities	–	75	0	Bone	0.58	28
				Thyroid	0.6	30

* Quarterly (13 wk) maximum permissible dose.
† Annual maximum permissible dose.
‡ Cumulative maximum permissible dose.
§ Maximum permissible dose rate.
‖ Age in years of the potentially exposed person.

Federal regulations have been formulated by not only the AEC but also the Bureau of Mines, the Department of Labor, the Department of Health, Education, and Welfare, and the transportational agencies of the Interstate Commerce Commission, the Civil Aeronautics Board, the United States Coast Guard, and the Post Office Department. In addition, approximately 25 per cent of the states have formulated comprehensive state regulations on the use

of sources of ionizing radiation. Approximately 50 per cent of the states have set forth partial regulations on radiation protection. Many of the large cities have also developed and promulgated regulations on radiation protection.

In essence, these regulations require adherence to certain standards and procedures for protection and control, licensing (registration of sources), and reporting of data.

One must, therefore, have knowledge of these regulations and set up a program that will adhere to these regulations.

LEGAL IMPLICATIONS

The basic policy for dealing with the potential legal problems introduced by the use of sources of ionizing radiation should be one that attempts to provide data and services in the field of radiation protection which serve the best interests of both the individual and the university. The data compiled and recorded should be such that false claims may be repudiated and just claims substantiated. This goal is very difficult to attain. The following outline indicates some of the problems and their possible solutions.

Legal Problems and Possible Solutions

1. *Adequacy of program.* The adequacy of the program is difficult to determine and varies with time. In essence, the adequacy of the program will have to be evaluated with respect to the time under consideration. A program that is considered adequate this year may be inadequate next year. From a technical and legal viewpoint the radiation protection program should be continually evaluated with respect to its adequacy.

2. *Radiation exposure records and reports.* Technical overexposure should be investigated and comments on the readings entered into the report. Reports should take into consideration the legal implications of the circumstances leading to the overexposure.

3. *Insurance coverage.* There is need for review of insurance coverage with respect to: (1) present exclusion clauses that have been placed on fire policies, (2) the extension of coverage in malpractice policies, (3) the coverage of persons using licensed amounts of

radioactive material, and (4) the extension of coverage on party liability.

4. *Hiring and termination policies.* The need to have records on new employees who may have had a radiation-exposure history is increasing. Pre-employment and termination urinalyses are desirable to ascertain initial and terminal internal exposures to radiation in addition to the normal bioassay program.

ADMINISTRATIVE AND TECHNICAL ASPECTS

The solution to the health, regulatory, and legal problems must come from the integration of appropriate technical applications and effective administrative procedures. There is no simple, unique, or standard method for the development of a program. However, there is need, regardless of the situation, to consider: working standards, methods and procedures, education and communication, emergency plans, record keeping, calibrations, and technical evaluations.

In general, the first step must be a consideration of the specific problems associated with the particular program. The following factors, for instance, are associated with the Harvard Radiation Protection Program.

At the present time there are more than 400 persons who wear film badges under the Harvard Program. More than 100 laboratories use sources of ionizing radiations. There are more than fifty radionuclides frequently used. One-third of the radionuclides are pure beta emitters, and more than 90 per cent of the total radioactive material used involves low energy beta emissions. There is, therefore, need for the effective measurement of weak- or low-energy beta exposures. In addition to radioisotopes and x-ray units, sources of ionizing radiation also include cyclotrons, linear accelerators, and neutron sources, so there is need for neutron energy-spectrum analyses, to evaluate the potential hazards associated with the use of these sources. Thus at Harvard it was necessary to give additional consideration to weak-energy beta and neutron dosimetry in the development of a program for radiation protection. It seems appropriate here to discuss briefly the progress that has been made with respect to weak-energy beta dosimetry.

BETA DOSIMETRY

The need for an improved method of control and protection in the use of weak-energy pure beta emitters such as C^{14}, S^{35}, and Ca^{45} is evident when one calculates the average dose rate from small quantities of these substances on the surface of the skin as presented in Figure 1. Since we are concerned with the dose rate at and beyond the basal layer of the epidermis to the range of the material in the body, the lower curve in Figure 1 is of greater importance. At the present time the commercially available pocket dosimeters (pencil ionization chambers) and film badges are inadequate for the detection of C^{14}, S^{35}, and Ca^{45}. A pocket dosimeter capable of detecting C^{14}, S^{35}, and Ca^{45} external exposures was developed by Fitzgerald and Feinberg at the Knolls Atomic Power Laboratory.[1] A similar study was conducted at the Oak

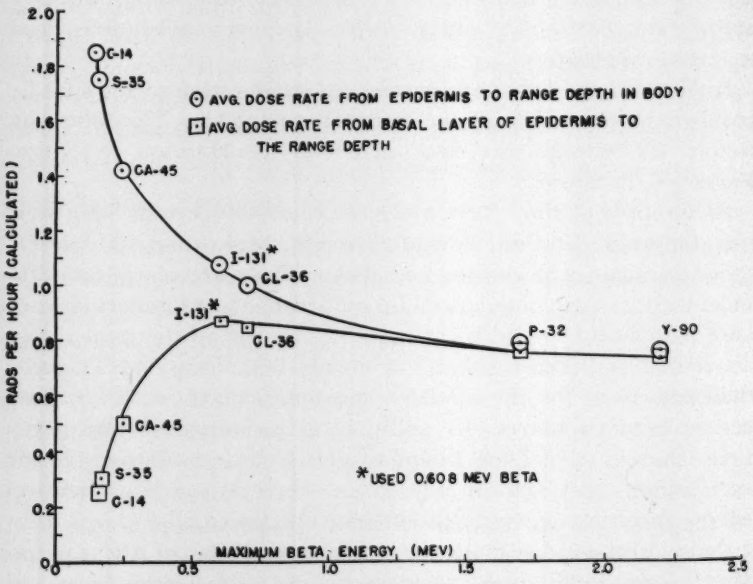

Figure 1. Dose rate from beta emissions ($1 \mu c/cm^2$ on skin)

[1] J. J. Fitzgerald and R. J. Feinberg, "Recent Developments in Personnel Radiation Dosimetry," *Proceedings of the Nuclear Engineering and Science Conference, March 17, 1958, Chicago* (American Institute of Chemical Engineers, New York).

Ridge National Laboratory.[2] Typical pocket dosimeters with wall thickness of 7 mg./cm.^{2} beneath the perforated aluminum wall structure are shown in Figure 2. These dosimeters have an efficiency of approximately 5 per cent for the detection of C^{14}, S^{35}. They are approximately 8 per cent efficient in the detection of Ca^{45}. A total dose of 5 mrad is detectable.

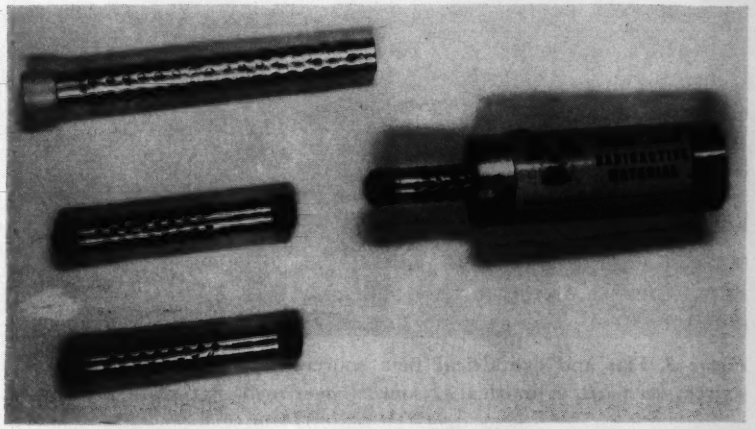

Figure 2. Beta pocket dosimeters, full and half chamber—*upper left*, 50 per cent perforated; *lower left*, conducting mylar windows (7 mg/cm^2); *right*, Al wall structure

These dosimeters and thin-window survey meters have been calibrated over a wide range of beta energies at the Knolls Atomic Laboratory.[3] Recent studies at Harvard have been confined to the comparison of readings from flat and cylindrical sources. The most energetic source and the least energetic source with which we were concerned were used in these studies. These sources as shown in Figure 3 are natural uranium and C^{14}.

Since beta dosimeters are not available at this time, a method

[2] H. Hubbell, Jr., R. Birkhoff, and R. Johnson, Pocket Ion Chambers for Beta Radiation Dose, Oak Ridge National Laboratory Report, ORNL–2158.

[3] C. M. Hastings, C. G. Detwiler, and J. J. Fitzgerald, Beta Energy Dependence Correction Factors for Cutie Pie and Juno Survey Meters, Knolls Atomic Power Laboratory Report, KAPL–1571.

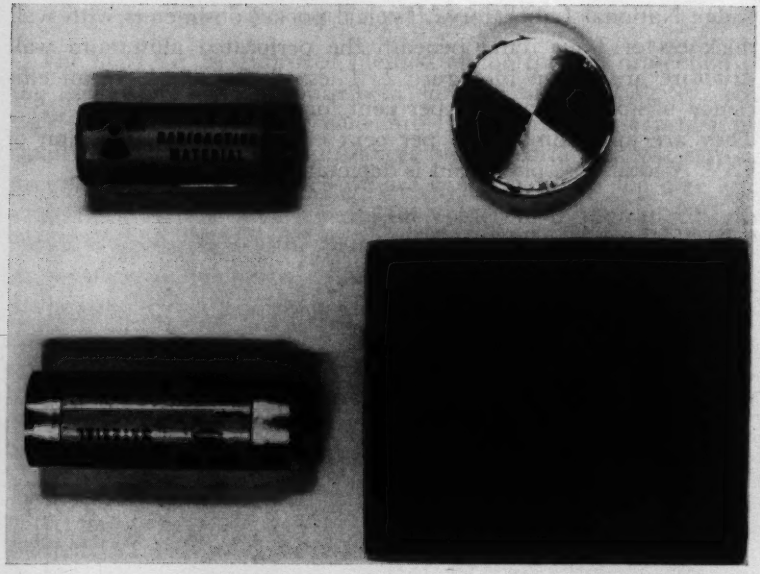

Figure 3. Flat and cylindrical beta sources—*upper left*, cylindrical C^{14} source; *lower left*, cylindrical U source; *upper right*, flat plate C^{14} source; *lower right*, flat plate U source

was developed whereby a portion of the outer white wrapping of DuPont film packet could be removed without exposing the film or exerting pressure on the film, which could cause the film to become darkened. As indicated in Figure 4, the thickness of the white and green wrapping are sufficient to absorb the C^{14} and S^{35}. Although some Ca^{45} may penetrate through the outer wrapping to the film, the quantity is very small. The removal of the outer white wrapping permits approximately 10 to 15 per cent of the C^{14} and S^{35} activities to reach the film. (See Table 5.) The darkening under the green wrapper caused by C^{14} and Ca^{45} are illustrated in Figure 4. It should be noted that there is no indication of exposure under the white wrapping. Consequently, it may be possible for someone working with C^{14} to receive a very large external exposure without any indication of such an exposure unless he is using a pocket dosimeter or a film packet as described.

Table 5. Results obtained with beta film badge

Source of Activity	Per cent energy transmission	
	Through white and green wrapping film (approx. 30 mg./cm.^{2})	Through green wrapping film only (approx. 7 mg./cm.^{2})
C^{14}	0	8 to 12
S^{35}	0	14 to 16
Ca^{45}	1	25 to 30

A calibration curve using the flat source of C^{14}, as presented in Figure 5, illustrates that an exposure of 60 mrad can be detected. It should be clearly noted that film darkening under the 7 mg./cm.^{2} covering does not necessarily mean that a person has received a significant exposure. Such results must be evaluated after discussion with the individuals involved. No darkening beneath the 7 mg./cm.^{2} area is a good indication of negligible exposures and good controls. Consequently, the beta film packet permits better control of exposures and provides improved records of potential weak-energy beta exposures.

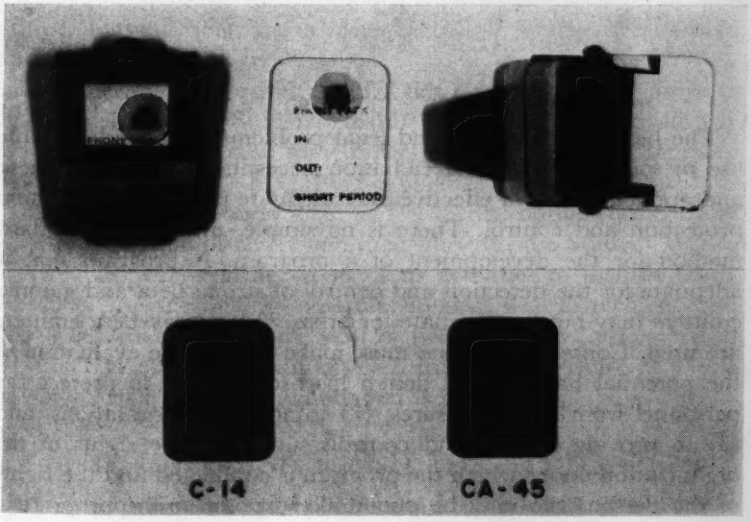

Figure 4. Beta film badge and results of study

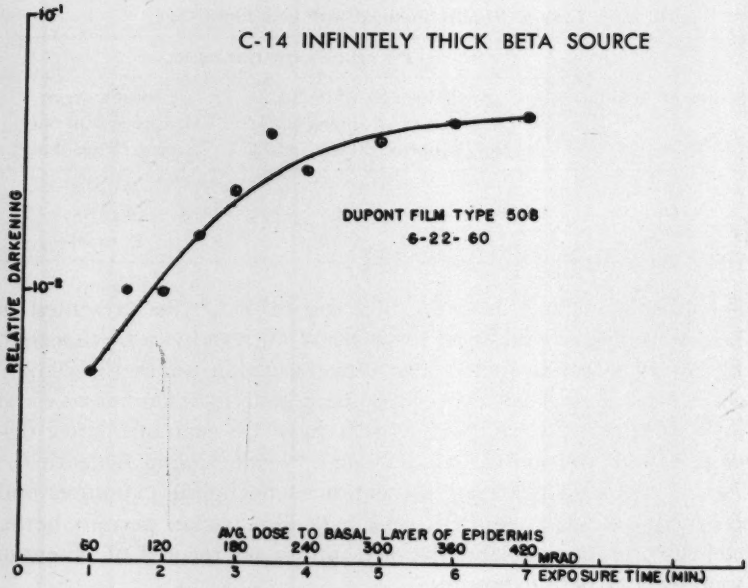

Figure 5. Beta film calibration curve

CONCLUSIONS

The health, regulatory, and legal problems associated with the use of sources in ionizing radiation necessitate the development and application of an effective and adequate program of radiation protection and control. There is no simple, unique, or standard method for the development of a program. A program that is adequate for the detection and control of strong beta and gamma emitters may not be adequate for areas where weak beta emitters are used. Consequently, one must make a complete evaluation of the potential hazards and design his program (1) to protect the personnel from such exposures, (2) to adhere to regulations, and (3) to provide records and controls such that the rights of the organization under which the program is conducted and the rights of the person who may be potentially exposed are appropriately protected.

The Student Health Service in the University of Hong Kong

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UNIVERSITY OF HONG KONG

THE end of the Second World War found Hong Kong University an empty shell—buildings looted, equipment lost, overseas staff mostly scattered or dead. In 1946 the gigantic task of rehabilitation began, and the decision of the Secretary of State for the Colonies, made early in 1948, to support its re-formation was a guarantee that the institution which was the torch of western culture in the Orient and a *lumen ex Oriente* for the West would continue to spread its light.

The postwar era brought many new ideas and new projects, among which was a Student Health Service such as had already existed for many years in some other universities of the Commonwealth.

Beginning on a modest scale in 1947 with routine medical and x-ray examination of newly admitted students, the Student Health Service has widened the scope of its activities to include many aspects of student welfare, environmental as well as medical, and is now served by a full-time staff of two physicians, a nurse, and a clerical assistant, and administered from a well-equipped Clinic in which "sick bay" accommodation is provided.

THE UNIVERSITY AND THE STUDENTS

The University is residential, is open to students of all races, nationalities, and creeds, and comprises the four faculties of Arts,

Science, Medicine, and Engineering and Architecture. There are 1,116 students, of whom 27.6 per cent are women; the number has increased steadily from 820 in 1956, and by 1966 will top 2,000. Every student, unless specifically exempted, is required to reside in one of the seven residence halls for a period of three years, 185 days being a year's residence. Fifty-five per cent of the student body is at present accommodated in the residence halls, and the University shows one of the highest proportions of students in residence in the Commonwealth. Of the seven residence halls, four are administered by the University, and three by religious missions.

Ninety per cent of the students are of local domicile, the remaining 10 per cent coming largely from Malaya. The average age of men on admission is twenty-one, of women, twenty. Ninety-six per cent of the students are Chinese. Tables 1 and 2 show the distribution of students according to nationality or race and faculty at the end of 1959.

Table 1. Nationality (or race) of students at the University of Hong Kong, 1959

Nationality (race)	Male		Female		Total	
	No.	%	No.	%	No.	%
Chinese	786	70.4	290	26.0	1,076	96.4
Indian	9	0.9	6	0.5	15	1.4
Eurasian	6	0.5	5	0.4	11	0.9
Portuguese	3	0.3	6	0.5	9	0.8
Malayan	2	0.2	1	0.1	3	0.3
Others	1	0.1	1	0.1	2	0.2
TOTAL	807	72.4	309	27.6	1,116	100.0

Table 2. Distribution of students by faculty in 1959

	Arts	Science	Medicine	Engineering	Architecture	Social studies (special course)
Male	283	116	261	79	56	12
Female	236	33	21	—	8	11
TOTAL	519	149	282	79	64	23

A study of the financial background of students at the time of admission during the past three years shows that in approximately 30 per cent of cases the head of the family was in business, in 30 per cent a civil servant or a white-collar worker, in 25 per cent a professional man, and in 2 per cent a skilled or unskilled worker (in 13 per cent there is no record of occupation). Financial difficulties on admission were recorded in approximately 40 per cent of cases; 30 per cent were receiving aid in the form of bursaries or scholarships, and many had part-time jobs, mainly tutoring. A major contributing factor is the size of the average Chinese family, which is generally bigger than those in Europe. Only in 5 per cent of families was a student the only child, and in more than 50 per cent there were five or more children.

ORGANIZATION

The Student Health Service is financed by the University and is administered by a Student Welfare Committee through a full-time physician. Although it functions independently, close collaboration exists with the medical faculty of the University and the Hong Kong Government Medical Department, so that students may be referred for consultation or admitted to hospital for treatment.

Staff

The staff comprises a medical officer, a woman assistant medical officer, a nurse, a clerk and a laboratory assistant.

University Clinic

In 1957 a four-room house, previously a staff residence, was converted and equipped as a University Clinic, comprising consulting room, small laboratory, waiting room, recovery room, nurse's room, office, and two small single-bed rooms serving as "sick bays" for male patients. The Clinic has office hours when students may consult the Health Officer throughout terms and vacations. It is fully equipped for normal outpatient routines.

Sick Bays

The sick bay in the Clinic for male patients is supplemented by a similar two-room sick bay for female patients in a women's residence hall; both are designed for students requiring daily observation or isolation, yet whose illness does not warrant admission to the hospital. With the current shortage of hospital beds, these sick bays have proved very useful. In sick bay a patient may undergo more thorough examination and more effective continuous care than at home. Among diseases satisfactorily managed in the sick bays were cases of mumps, chickenpox, infectious hepatitis, dysentery, erysipelas, and serum sickness.

Finance

A "composition fee" which all students pay on entry includes a nominal amount for the cost of medical treatment.

Table 3. Finances of the Student Health Service

Years	Staff salaries	General expenses	Total	Students	Staff
1956–1957	£2,894	£1,250	£4,144	861	1,362
1957–1958	£2,999	£1,250	£4,249	945	1,426
1958–1959	£3,494	£1,250	£4,744	986	1,610

Table 3 shows recurrent expenses of the Service from 1956 through 1959. It should be noted that these figures cover medical facilities not only for students but also for staff. No contributions toward cost are made by the staff.

ACTIVITIES OF THE STUDENT HEALTH SERVICE

It has always been the aim of the Service to maintain flexibility and to adapt to local conditions. With a student population mostly domiciled in Hong Kong, where private medical care is easily available, the emphasis has always been on the health of the student body as a whole, on environmental health, and on special clinical and psychological problems.

Medical Examination and Interview on Admission

A medical examination is compulsory for all new students. Its purpose is the discovery of disabilities which, unknown to the student, may affect health or academic performance. No student, however, is ever rejected from the University on medical grounds. During the interview inquiries are made into previous schooling, interests, and family background, and a general impression is received of each student's personality. The findings of the medical examination, which comprises physical examination, blood count, blood grouping, Mantoux test, and urinalysis, are entered into individual files, which are also used for follow-up records in the course of ordinary clinic visits. A marginal punch-card index is used for recording some of the data. Any defects present are noted, and arrangements made for treatment or further examination where necessary.

Students who are found Mantoux-negative are offered BCG vaccination; generally, all can be persuaded to accept it. On the average, 15 per cent of men and 20 per cent of women are found Mantoux-negative.

Three hundred and seventy full-time students entered the University in September 1959. Table 4 shows findings on physical examination. The chief findings requiring correction were previously uncorrected refractive errors, dental, oral, and skin defects.

X-ray examination is compulsory for all new students. Eleven cases of active disease were found. (See Table 5.)

Medical Care of Sick Students

Normally, students who need medical attention will consult the Student Health Officer at the Clinic; but if a student is too ill to come to the Clinic, he is visited in his residence hall if he resides. A student residing at home who wishes to be examined by the doctor at home must make his own arrangements.

Although many students have family doctors, the University Clinic is well patronized. This is in part due to the proximity of the Clinic to the lecture rooms. During 1959, 58.5 per cent of all students attended the Clinic at least once.

When a specialist's opinion is required, students are referred to

Table 4. Findings on physical examination of 370 new entrants

Defects found	No.	%
Defective eyesight: corrected	256	55.3
uncorrected	49	10.6
Color blindness	20	4.3
Other ocular	5	1.1
Dental and oral	43	9.3
Ear, nose, and throat	8	1.7
General surgical	8	1.7
General medical	8	1.7
Gynecological	1	0.2
Orthopedic	27	5.8
Skin	34	7.4
Psychological	4	0.9
TOTAL	463	100.0
Cases requiring immediate treatment	50	10.8
Cases requiring treatment later	47	10.2
Treatment not needed	366	79.0

Table 5. X-ray findings on new students

	No.	%
Normal chest	338	91.3
Active tuberculosis	11	3.0
Quiescent tuberculosis, requiring observation	11	3.0
Healed tuberculosis, not requiring observation	7	1.9
Other abnormalities	2	0.5
Did not complete examination	1	0.3
TOTAL	370	100.0

the University Faculty of Medicine specialists or, in some cases, to the specialists of the Hong Kong Government Medical Department. Both have been highly co-operative in their readiness to consult and in waiving consultation fees.

Those who require treatment in hospital are sent to Queen Mary Hospital, a government hospital in which the medical faculty teaches. While in the hospital students are charged normal maintenance rates, but treatment fees are usually waived. Many prefer to be admitted to the general wards, where the charge is

only about $.60 to $1.00 a day; and students from the dormitories receive a refund of about $.60 a day for the period.

Medical facilities offered by the Health Service, free of charge, include medical care, drugs, dressings, and laboratory tests. Because x-ray facilities are readily available at the government hospital, the Clinic does not maintain an x-ray service. When an x-ray is required in the course of examination, students (though not medical students, for whom it is free) are charged for it, generally an amount well within their means.

Table 6 shows the annual clinic visits, consultations with specialists, and hospital admissions during the last four years.

Table 6. Annual visits to the Clinic, referrals to specialists, and hospital admissions

Year	No. of students in University	No. of visits to Clinic	No. referred to specialists	No. admitted to hospital
1956	820	1,496	42	4
1957	945	1,681	62	9
1958	986	1,828	57	16
1959	1,116	2,516	70	8

Sickness Incidence

Students on the whole are a relatively healthy group. The majority need to consult a doctor only for minor illnesses, such as transient upper-respiratory infections. Table 7 shows the distribution of sickness and injuries among students during 1958 and 1959, in six-month periods. For simplification all diseases are divided into four broad groups: (1) respiratory infections, (2) other illnesses of short duration, (3) injuries, and (4) diseases of a chronic nature.

The "respiratory infections" consisted mostly of upper respiratory catarrh, common colds, sore throats, and tonsillitis. An influenza epidemic in the spring of 1958 accounts for the high incidence of upper respiratory infection in that period.

"Chronic or continued illness" comprises such conditions as peptic ulcer, asthma, pulmonary tuberculosis, and psychosomatic disorders.

Table 7. Distribution of sickness and injuries

Disability	1958				1959			
	Jan.–June		July–Dec.		Jan.–June		July–Dec.	
	No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
Respiratory infections	245	52.8	140	45.9	138	41.1	122	43.7
Other short-duration illnesses	131	28.2	106	34.8	119	35.5	95	34.1
Injuries	17	3.7	8	2.6	9	2.6	11	3.9
Chronic or continued illness	71	15.3	51	16.7	69	20.8	51	18.3
TOTAL	464	100.0	305	100.0	335	100.0	279	100.0

SPECIAL CLINICAL PROBLEMS

Pulmonary Tuberculosis

The control of pulmonary tuberculosis is the Clinic's most urgent problem. Hong Kong has one of the highest tubercle-infection rates in the world; though accurate figures are not available, the morbidity rate is probably high too. This trend is reflected among the student population, in whom the incidence of pulmonary tuberculosis is high. Measures of control are the detection and treatment of early cases and the supervision of quiescent cases until the disease is arrested.

The compulsory x-ray examination of all entering students is made annually at the beginning of the first term, by mass miniradiography. Continuing students also are encouraged to attend this examination, and an attendance of about 75 per cent can be considered satisfactory. Most of the positive cases that are found on subsequent examination to require treatment are minimal, clinically inactive and respond well to ambulatory courses of streptomycin, para-amino-salicylic acid, and isoniazid, given at the Clinic. Those few requiring treatment in hospital are usually admitted to one of the special government hospitals. Four students in 1958 and three in 1959 were treated in hospital, for periods ranging from three to twelve months. The annual x-ray examina-

tion helps to detect early cases and prevent the need for hospital treatment.

New students who are already under the care of private doctors for pulmonary tuberculosis are encouraged to continue such treatment, and the Student Health Officer seeks news of progress from time to time.

The mass mini-radiography, and much of the subsequent assessment, is carried out by the Government Tuberculosis Service.

Table 8 shows the incidence of tuberculosis among students during the past four years.

Table 8. Incidence of tuberculosis

Year	Total no. of students	Active t.b. cases		Quiescent t.b. cases		Total t.b. cases	
		No.	%	No.	%	No.	%
1956	817	8	1.0	41	5.0	49	6.0
1957	836	14	1.6	37	4.3	51	5.9
1958	986	28	2.8	48	4.8	76	7.7
1959	1,116	19	1.7	55	4.9	74	6.6

Mental Disease

1. Hong Kong students, like all students, are prone to psychosomatic disorders. The present-day highly competitive atmosphere of university life and its resulting tensions, and the anxiety caused by examinations, are to a large extent responsible. Peptic ulcer syndrome, neurodermatitis, anxiety state, and pre-examination tension are the commonest conditions encountered.

2. Schizophrenia occurs with regularity, at an incidence of about 0.2 to 0.3 per cent. Students developing schizophrenia are placed under the care of a psychiatrist, and if they respond well to treatment are encouraged to continue study. All schizophrenia cases so far were men.

Table 9 shows the incidence of these disorders in 1959.

Counseling

Psychological problems, sometimes accompanied by psychosomatic disorders, are common among students and may often be

Table 9. Incidence of mental and psychosomatic diseases in 1959

Disease	No.	%
Peptic ulcer	10	0.9
Schizophrenia	3	0.3
Neurodermatitis	10	0.9
Anxiety neurosis and other psychosomatic disorders	15	1.3

traced to a failure to adapt to the sudden change in environment. Many come from homes where the strict traditional Chinese attitude is dominant, where all decision belongs to the head of the family, and where outside friendships are not made except against obstacles. Entry into a residential community not bound by family ties often finds a student ill at ease in social contact and indecisive in situations demanding personal solutions. Although the average age on entry is twenty and over, many students are still emotionally and socially immature. Problems mostly concern studies and resident social life.

Counseling, therefore, plays an important part in the work of the Health Service. Sometimes it takes a long time to achieve rapport with a student, but once established, patient discussion of problems, supported by gentle guidance and encouragement, has had effective results.

On the other hand, general emotional and social immaturity is tempered by a natural reserve and by the traditionally high moral upbringing; this fusion of qualities accounts for the otherwise remarkable absence of venereal disease, drug addiction, alcoholism, and unmarried pregnancy.

Climatic Diseases

Although the climate is subtropical, there are no special climatic problems these days. Epidemics of plague, smallpox, and cholera are things of the past. Once-common malaria is almost eradicated from the urban areas. Enteric fever is present but presents no serious problem. One of the commonest tropical diseases is food poisoning caused by the *Salmonella* group of organisms; especially prevalent during the hot and humid months of summer, the disease is nevertheless mild, responds quickly to treatment, and so

far there has not been a serious outbreak among residing students. Cases of skin infection and otitis externa also increase during the hot weather, whereas the winter months bring cases of upper respiratory infection and tonsillitis. No vitamin deficiency has been noted.

ENVIRONMENTAL HEALTH

Housing

In the residence halls students live mainly in single rooms, though there are also a few double rooms. Meals are taken in a common dining room. The University aims at maintaining within each residence hall a full social and cultural life.

Nutrition

Catering in each residence hall is managed by a chief cook, who has a fixed food allowance—in most residence halls about $.60 a day for each student. The menus are mainly Chinese, though in some residence halls European dishes are also served. There is no qualified dietitian in charge of the food service, and it lacks expert supervision and planning.

Sanitary arrangements in the residence halls and their kitchens are regularly inspected by the Student Health Officer, who reports to the Wardens. Three of the residence halls were built more than forty years ago, and the kitchens have never been modernized; in these conditions regular inspections are essential.

HEALTH EDUCATION

Many of the students reveal an astonishing ignorance of the elementary principles of hygiene and personal health. A high percentage of the oral defects found can be attributed to insufficient care of the teeth and gums. Health education forms an important item in the health program, and, though formal health education in the form of lectures is not a part of the curriculum, every opportunity is taken to give informal instruction—for instance, during the initial personal interviews and subsequent visits to the Clinic. Recently, the students' magazine carried a series of popular

articles by the Health Officer dealing with such topics as care of teeth and skin, prevention of disease, the value of exercise, relaxation, and hobbies. Reading material covering health and hygiene is available in the waiting room of the Clinic.

MEDICAL ASPECTS OF PHYSICAL EDUCATION

Classes in physical conditioning, in fencing, tennis, Chinese shadow boxing (*t'ai ch'i ch'uan*), and other training programs, in which participation is voluntary, are organized by the Director of Physical Education. Close co-operation is maintained between him and the Student Health Officer, because of their common purpose to raise the physical standards of the whole student body. At the initial medical examination students with poor physique and minimal interest in physical activity are identified, and an attempt is begun to interest them in improving their physical condition.

CONCLUSION

The Student Health Service in the University of Hong Kong is still comparatively young, and there are gaps in it which must wait their turn with many other important academic needs.

The future may bring two important developments: dental care and a planned food service under the supervision of a qualified dietitian.

Since its beginning the Service has avoided a stereotyped role; but although local conditions have always been important guiding factors in the designing of the health program, the aims have reflected those of other universities: the safeguarding of the students' health and the provision of a healthful environment in which they may study successfully while developing physically, emotionally, and socially.

Emotional Disturbances in College Students: Separated Parents as a Factor

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ONE of the questions printed on each student's health record is "Are your parents separated?" An affirmative response to this question is indicated if parents are separated for the usual reason of marital incompatibility and also if a parent is deceased.

This question was included in the medical history form on the assumption that, as a group, students whose homes had been disrupted by the absence of one or both parents would be somewhat more susceptible to clinically significant emotional disturbances at college than those from "normal" homes.

We have now had an opportunity to test the validity of this assumption. The procedure consisted of checking 1,000 consecutive health records of students enrolled in the spring term, 1960, for the following information:

1. Whether or not the parents were listed as "separated" at the time of the entrance medical examination.

2. Whether or not there had been a clinical diagnosis, based on observations made subsequent to college entrance, falling within the general category of emotional disturbance. This would include the various types of clinically significant anxieties, neuroses, and other personality disorders. Not included were the so-called

neurogenic disorders such as asthma, various allergies, irritable bowel, and migraine.

Our results were as follows: Of the 1,000 students, 106 recorded separated parents. In sixteen of these, or 15.1 per cent, emotional disturbance was diagnosed. Of the 894 students from "normal" homes, 70, or 7.8 per cent, were diagnosed as having an emotional disturbance.

CONCLUSION

Students on this campus whose parents are separated are about twice as likely to show clinically significant emotional disturbances as are other students.

Book Reviews

Internal Derangement of the Knee Joint. (*Clinical Orthopaedics, Number Eighteen.*) Anthony F. DePalma, ed. Philadelphia and Montreal: Lippincott, 1960. 293 pages.

The subject of internal derangement of the knee is given emphasis and treated comprehensively in this volume of a series of symposia published triannually. In addition to articles by such American authorities as Don O'Donoghue and the recently deceased Duncan McKeever, there are others written by well-known orthopedic surgeons from England, Scotland, Japan, and Israel. Although much space is devoted to the technical aspects of knee surgery, nevertheless there is a great deal that is of practical value to the student-health or athletic-team physician. For example, the treatise on chondromalacia patellae (with excellent illustrations) by M. B. Devas of Hastings, England, contains essential information that should be thoroughly understood by all who handle knee problems. Popliteal cysts and osteochondritis dissecans of the knee joint are common problems treated extensively in other articles. The contribution by G. Murdock of Dundee, Scotland, with the provocative title "Meniscus Removed in Error" will be particularly valuable to those who must make the final decision on whether or not to operate. His observations are based on his experience with 4,161 cases of knee meniscectomy. This symposium is a valuable contribution to orthopedic literature.

ALEX RACHUN

Cornell University

Sources of Information on Behavioral Problems of Adolescence. The Committee on Academic Education, American Psychiatric Association. Washington: American Psychiatric Association, 1960. 96 pages. $3.00.

This is an index of scientific studies and their sources, dealing with youth from ages 14 to 22. Its objective is to promote interdisciplinary research in the area of behavioral problems of adolescence. Therefore, the compilation includes basic studies from the disciplines of anthropology, psychology, psychiatry, social work, criminology, education, medicine, and sociology.

The contents are: (1) a directory of American institutions engaged in youth research, (2) a directory of current bibliographical services, (3) an analysis of the coverage of journal articles on youth by standard indexing and abstracting services, (4) a list of periodicals pertinent to the study of youth, and (5) a bibliography of youth research. This last section is the major part of the publication and contains a listing of 1,445 books, articles, and unpublished dissertations, covering the period from 1945 to 1958. The bibliographical items are ordered according to area of study, such as academic success, college students, and mental health. Under each heading the investigators are listed in alphabetical order.

This publication is highly recommended for any researcher who is interested in the area of behavioral problems of adolescence.

LEIF J. BRAATEN

Cornell University

Abstracts of Current Literature

Johnson, E. E., G. H. Stollerman, B. J. Grossman, and H. McCulloch. Streptococcal Infections in Adolescents and Adults after Prolonged Freedom from Rheumatic Fever, *New Engl. J. Med. 263:* 105–111, July 21, 1960.

It has become accepted practice to give continuous antibiotic prophylaxis to patients with a history of recent rheumatic fever to prevent streptococcal infections and subsequent reactivation of rheumatic fever. The authors studied the effect of stopping *continuous* prophylaxis in those who had been free from rheumatic activity for at least five years. They substituted a modified form of prophylaxis in which only symptomatic streptococcal infections were treated with antibiotics. Asymptomatic infections were detected by throat cultures and determinations of streptococcal antibodies, which were made every two months and during respiratory infections.

The 298 patients were followed for a total of 572 patient-years. The most striking observation was the low rate of streptococcal infection in the adult age group (twenty-three to seventy years of age) as compared to the rate in adolescents (eleven to twenty-two years of age). In adults the infection rate was 12.8 per cent per patient year as contrasted to 23.2 per cent per patient year in adolescents. The recurrence rate of rheumatic fever was 1.8 per cent per patient year in the 204 patients in the adolescent age group. There were no recurrences in the 94 adults. In concomitant studies, children receiving continuous prophylaxis had a rheumatic recurrence rate of 2.4 per cent per patient year. The authors emphasize that these preliminary data should not be considered a sound basis for modifying current recommendations for prophylaxis in the rheumatic subject.

RALPH W. ALEXANDER

Cornell University

Palmer, W. L. Causality in Peptic Ulcer, *A.M.A. Arch. Int. Med.*, *106:* 786, Dec., 1960.

The author discusses certain factors considered causal in the pathogenesis of peptic ulcer and summarizes the evidence that the basic problem lies in the relationship between the destructive or digestive action of acid gastric juice and the resistance of the mucosa. In duodenal and jejunal ulcers, which are characterized by gastric hypersecretion, the "acid attack" is usually predominant, whereas in gastric ulcer in which gastric secretion is normal or low the defect in mucosal resistance is presumably of greater importance. Certain drugs have been shown to be specific stimulants of gastric secretion and therefore potentially ulcerogenic; these include histamine, cinchopen, reserpine, and phenylbutazone. Other drugs, including the corticosteroids, may be ulcerogenic, but the author feels that the presently available evidence is inconclusive and that additional studies are necessary to establish this.

RALPH W. ALEXANDER

Cornell University

Raab, W. Metabolic Protection and Reconditioning of the Heart Muscle through Habitual Physical Exercise, *Ann. Int. Med.*, *53:* 87–105, July 1960.

It is one of the paradoxes of our time that modern American cardiology, with its stupendous progressiveness in other respects, has until quite recently imperturbably avoided consideration of neurogenic biochemical pathogenic mechanisms in the origin of functional and degenerative diseases of the heart. The advent of simplified methods of catecholamine assay has stimulated interest in the biochemical and cardiotoxic effects of the sympathetic system and of its neurohormones, norepinephrine and epinephrine.

Three hundred and sixty men with widely varying exercise habits were studied. The results showed a proportionate relationship between the degree of habitual exercise and the neurovegetative status of the heart: with increasing amounts of regular exercise there was a linear decrease of sympathetic tone (diminution of heart rate and lengthening of the isometric period), which is

considered to be favorable to the maintenance of a healthy myocardium. The experimental and statistical observations permit the assumption that regular habits of vigorous physical exercise (together with dietary precautions and, if possible, avoidance of excessive emotional stresses) contribute to the maintenance of myocardial health. Further they suggest that inactivity-induced adrenergic preponderance contributes significantly to the high cardiac morbidity and mortality in Western nations. Because of the concomitant occurrence of other factors, especially atherogenic dietary factors and emotional stress, the exact contribution from physical inactivity cannot be clearly defined.

Systematic physical training under proper supervision is to be encouraged, even in the aged, for both preventative and rehabilitative values have been demonstrated for it. European countries have instituted large-scale conditioning programs and, because of their proven value in reducing absenteeism and medical-care expense, some large German insurance companies and industries have provided financial support for such programs. The author urges the establishment of such conditioning programs in this country, both for their value in prevention and rehabilitation and for further research.

RALPH W. ALEXANDER

Cornell University

Rutenberg, A. M., H. L. Greenberg, and F. B. Schweinburg. Clinical Experiences with 2,6-Dimethoxyphenyl Penicillin Monohydrate in Staphylococcal Infections, *New Eng. J. Med.*, *263:* 1174–1178, Dec. 8, 1960.

A new synthetic penicillin, dimethoxyphenyl penicillin (Staphcillin, Bristol), was studied in vitro and clinically to determine its effectiveness against staphylococci. One hundred clinical isolates of staphylocci, most of which were coagulase positive and resistant to the tetracyclines and streptomycin, were tested simultaneously for in vitro sensitivity to dimethoxyphenyl penicillin and to penicillin G. Ninety-eight of these, of which 93 were resistant to penicillin G, were inhibited by 6.3 micrograms per milliliter or less of dimethoxyphenyl penicillin. The other two strains were inhibited by 10.3 and 12.5 micrograms per milliliter, respectively.

Forty-one patients with a variety of infections, chiefly staphylococcal, received dimethoxyphenyl penicillin. Thirty-one of these had failed to respond to treatment with other antibiotics. In all forty-one there was a favorable response. Resistant strains of staphylococci have not yet been encountered. Dimethoxyphenyl penicillin is apparently resistant to penicillinase. In this small series no side effects were observed; however, allergic manifestations have been observed by others.

RALPH W. ALEXANDER

Cornell University

Sartwell, P. E. and L. E. Dyke. Comparative Sensitivity of College Students to Tuberculins PPD-S and PPD-B, *Amer. J. Hygiene*, *71:* 204–211, March, 1960.

Considerable evidence has accumulated which suggests that some positive tuberculin tests are nonspecific and not indicative of infection with the tubercle bacillus but may be responses to infection with other acid-fast organisms. The "Battey" organism is a nonphotochromogenic acid-fast bacillus which has occasionally been isolated from tuberculosis-like pulmonary infections; skin tests with antigen prepared from the "Battey" bacillus have frequently been positive in residents of the southeastern United States, where the "Battey" bacillus has been found.

The study reports the results of simultaneous testing of 1,225 freshmen university students with standard tuberculin (PPD-S) and a product similarly prepared from the "Battey" bacillus (PPD-B). Reactions to PPD-S occurred in 7.6 per cent of the group, and 23 per cent reacted to PPD-B. The authors also made observations in subgroups of their study population. Reactions to PPD-S were twice as high in lifelong residents of large cities as in those living in smaller communities; reactions to PPD-B were significantly higher in males than in females; and reactions to both antigens were much more frequent in those with a history of exposure to tuberculosis. The authors discuss the significance of these observations.

RALPH W. ALEXANDER

Cornell University

Watson, G. H. Emotional Problems of Gifted Students, *Personnel and Guidance J., 39:* 98–105, Oct. 1960.

In this report Professor Watson studies the records of all Brooklyn College students of high academic promise who came for personal counseling during a period of two academic years. For purposes of this study the group is divided into three—an honors group, a middle group, and a low performance group—and each is discussed individually. The honors student is described as a "tense, driven individual with a compulsive need to achieve which excludes almost everything else. . . . Fear tends to be his dominant emotion." According to the study honors students come largely from homes in which both parents were born abroad, and the father is a skilled workman. The average group shows more hostility and aggression, less fear. These students are more concerned with problems of personal identity. Many are student leaders, some very successful ones. Students in the low achievement group "often come from home situations that are described as brutalizing, over-powering, extremely destructive." The child may be rejected or overprotected. He finds it difficult to speak in class, to study. "In a sense, (some of) these students are committed to failure; they await it with the passivity of the defeated." However, a larger part of this group is rebellious and resistant, and sees all authority as dangerous and destructive.

Through a careful investigation of such factors as family background (with regard to place of birth, father's occupation), time of referral (60 per cent of the referrals were made during the last two years of college), and scholarship record (only twenty-five out of 100 graduates of known high capability earned honors), Professor Watson concludes that "there is no evidence that the students in the group were using the presence of emotional problems as an excuse for not doing well in college work . . . distress interferes with, if it does not prevent, effective study . . ." and to say that "reference to personal and emotional problems is merely a shield for failure avoids a grave situation by denying its existence."

GLADYS H. WATSON

Brooklyn College

Letter to the Editor

To the Editor:

Your editorial and the paper by Dr. Hathaway in the December, 1960, issue of "Student Medicine" are extremely interesting to me because they very closely parallel our own experience.

Prior to 1957 it was the practice at this college to examine all students. This was done on an assembly line basis using local physicians employed for this purpose. In 1957 we decided to examine only the freshmen. Every freshman is required to have a physical examination by his family physician prior to registration. During freshman orientation each new student fills out a health questionnaire. This questionnaire is copied almost exactly from the one which you use at Cornell. During 1957 I kept very careful track of the defects found as the result of the 268 freshman examinations which we performed. A tabulation was made of those which would have been found had we used only the pre-entrance physical examination and the questionnaire. Table 1 is a tabulation of our results, which I think you will find quite interesting.

You will note that very few defects were found on the physical examination which would not have been picked up by the combination of the pre-entrance examination and the questionnaire. The six heart defects were very slight functional murmurs.

As a result of this study we now do what we call a freshman interview. Each freshman is given an appointment at the Health Office. At this time a vision and a hearing test are made. We find that these two items are the most significant, because very few family physicians possess an audiometer and quite a few do not do accurate vision tests.

Following these two examinations each student is seen by the college physician. At this time I usually go over his physical examination form and questionnaire with him and have an oppor-

Table 1. Correlation of freshman physical examination findings with pre-entrance physical examination and health questionnaire in 268 freshmen examined in 1957

Condition	No. of defects found at freshman physical exam.	No. of defects reported on pre-entrance exam.	No. of defects reported on questionnaire	No. reported on both	No. not reported on either
Acne	56	17	7	5	37
Allergy	2	2	2	2	0
Anemia	3	3	3	3	0
Diabetes	1	0	1	0	0
Dysmenorrhea	13	12	11	10	0
Heart	13	3	7	3	6
Hearing defect	2	0	0	0	2
Miscellaneous	6	2	2	2	4
Orthopedic	6	3	5	2	1
Vision	7	1	3	1	4

tunity to question him or inquire about any items which seem significant to me. This also gives the student an introduction to the college physician and allows me to see each freshman at least once. We have found this to be a very satisfactory approach, and it is interesting that it is quite similar to the one used by Dr. Hathaway. The only exception is that in our case the physician does the interview rather than the nurse. Personally I prefer this, because I would like to see each freshman at least once during his college career.

Of course, we still do complete physical examinations on all of our athletes.

This year we have added a new program; we are now giving complete physical examinations, including urine analysis, hemoglobin determination, and tuberculin test, to all of our senior students. These are started each fall and continued throughout the winter into the spring. The reason for doing this is that we are a teacher-training institution, and the majority of our graduates are employed by public schools. Most of these school systems now require a physical examination prior to employment. Under our new system each graduating student will be furnished with a copy of his senior physical examination.

This is our answer to the problem of routine physical examinations. It would be interesting to see what other colleges are doing in this regard. It is also interesting to me that Dr. Hathaway and I have reached almost the same solution to this problem, with only a very slight difference in approach.

LEONARD J. SCHIFF, M.D.

State University College of Education
Plattsburgh, New York

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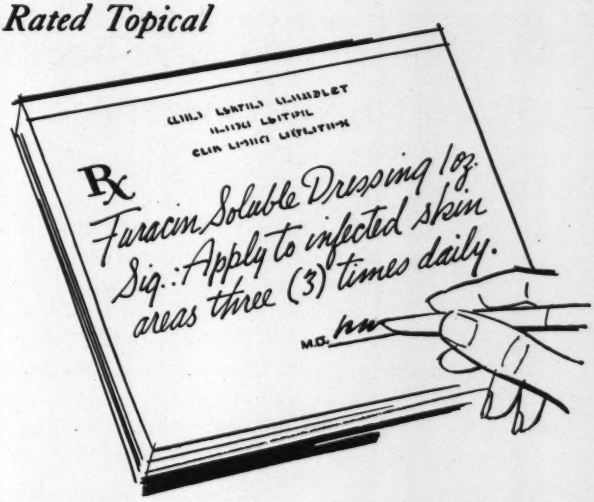

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Weiner, A. L., and Fixler, Z. C.: J.A.M.A. **169**:346, 1959.

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